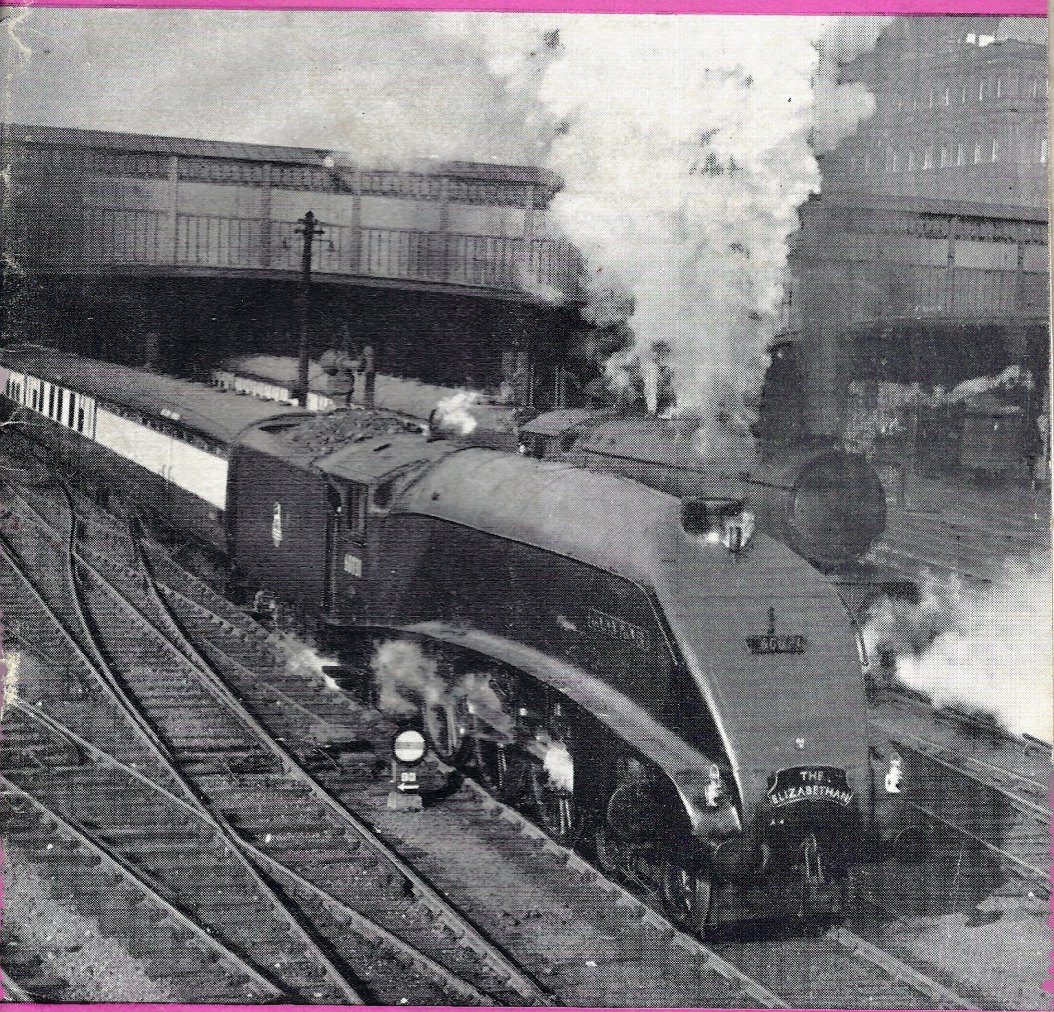
Trains ILLUSTRATED

Vol. IX DECEMBER, 1956 No. 12



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Vol. IX, No. 12
DECEMBER, 1956

The opinions expressed by contributors are not necessarily those of the Editor or Publishers.

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Front Cover : Star turn at Waverley—the departure of the southbound "Elizabethan" from Edinburgh for Kings Cross non-stop behind Class "A4" 4-6-2 No. 60031 *Golden Plover*. In the background is "V2" 2-6-2 No. 60927.
[Photograph by Eric Treacy

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EDITOR'S NOTE

The Editor will be happy to consider unsolicited contributions of articles or photographs, which should be sent to the Publisher's office. Every care will be taken, but neither Editor nor Publisher can accept responsibility in the event of loss. Articles should be written or preferably typed on one side of the paper only and double spaced, and should show the writer's name and address. Photographs should be not less than postcard size on glossy paper and each should have on the reverse details of the subject and the sender's name and full address. Notes for inclusion in "Motive Power Miscellany" and letters for publication are also welcomed and they should reach the Editor by the 28th of each month.

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★ Standard Class "4" 2-6-0 No. 76025 brings a train from Salisbury into Bournemouth West on April 11, 1955. On the right Bulleid Pacific No. 34106 *Lydford* is ready to leave with the 11.5 a.m. to Waterloo.
[D. M. C. Hepburne Scott

the editor's news & views

TALKING OF TRAINS

The years between

ONLY a diehard could fail to be cheered by the picture of British Railways in the late 1960's painted in the B.T.C. review summarised elsewhere in this issue ; and by the good news that it has prompted the Government to invest in the railways to the tune, maybe, of £250 millions, rather than abandon the B.T.C. to meet its swelling deficit by pushing its general rates and fares beyond the limit present traffic is likely to bear. On the other hand, the rosy prospect outlined in the White Paper is a comparatively distant one still, and the diligent reader is left with a number of unanswered questions about the more immediate future. For example, what will be the standard of passenger service between London, the West Riding and the North in the early 1960's ? Unquestionably, freight is the more important problem at the moment, with the drain to the roads unchecked and continuing. In the last two years, British Railways have lost another 7 per cent of the country's transport of deep-mined coal and as much as 10 per cent of their 1954 merchandise carryings ; first attention must be given to any means to check this decline. Probably this has a bearing on the fact that the great proportion of the pilot scheme diesels ordered are of mixed traffic character in the 1,000-1,500 h.p. range, which outward appearances, at any rate, suggest that British Railways have so far found unsuitable for the heaviest trunk route expresses ; and in any event it will be some years before diesels are available in substantial numbers. In other words, with electrification of the East Coast main line not scheduled for completion to York and Leeds until 1970, it looks as if the principal East Coast passenger services, in particular, may be left to fend with steam Pacifics either approaching or beyond normal life expiry for years to come. There is nothing sensationally alarming in that prospect, provided a reasonable amount of the capital now to be expended is devoted to making the maximum and most efficient use of steam power in its last years. But on this point the White Paper is silent ; and the cessation of work on rebuilding the Bulleid Pacifics suggests that pennies are being carefully counted where steam is concerned. Yet the French, surely, have proved what can be done to renovate steam power for an extended life term and what economy can be achieved thereby. One feels that a relatively small amount of

money spent now on the modernisation and maintenance of a few selected British types might pay more dividends than either letting them limp on to a merciful death, or providing for trunk routes to be electrified stop-gap diesels that other lines will be reluctant to take over second-hand when they become redundant.

●

In their first eight months of operation the diesel train services between Bacup and Bury carried 300 *per cent more passengers than did the steam trains between the two towns during the same period of* 1955. *Current costs of a British Railways two-coach diesel unit, incidentally, are about* £15,000 *for the power car and* £9,000 *for the non-motored trailer ; a modern road bus, by comparison, costs about* £4,500.

●

A B.T.C. design panel

WELCOME signs are multiplying that the often trenchant criticisms of the exterior styling of British Railways latest rolling stock have gone home. In his recent speech to the Institution of Mechanical Engineers, the chairman of the B.T.C., Sir Brian Robertson, requested his hearers to remember that "appearance is a very important part of design. The equipment must not only be modern—it must look modern." Now comes news that the B.T.C. have taken the sensible step of appointing an advisory panel on this question and propose to follow the wise example of railways overseas in seeking the counsel of professional designers and consultants outside the transport industry, as well as British Railways' own staff designers. The new panel will be concerned with equipment of all kinds which is used by passengers, customers and staffs, or is prominently visible to them or the general public, but the B.T.C. has requested the members to give priority to consideration of the styling of the new locomotives, rolling stock, electrical and other installations involved in the dieselisation and electrification proposed in the modernisation plan. Chairman of the new panel is Mr. T. H. Summerson, chairman of the N.E. Area Board and a member of the B.T.C. Its members include two men prominently associated with the development of industrial design in this country, Mr. W. J. Worboys (a Director of I.C.I. and Chairman of the Council of Industrial Design) and Sir Gordon Russell (Director of the Council of Industrial Design). The other members include three officers of the B.T.C.—Major-General Ll. Wansbrough-Jones (Secretary General) ; Mr. J. Ratter (Technical Adviser) ; and Mr. Christian Barman (Chief Publicity Officer)—with Mr. E. W. Arkle (Chief Commercial Manager, L.M.R.) and Mr. E. C. Ottaway (Chief Supplies Officer, L.T.E.), whose contribution to the design of London Transport road vehicles is well known. Mr. Barman, who is a Past President of the Society of Industrial Artists, has been appointed Executive Member of the panel ; like Mr. Ottaway, he is a member of the Faculty of Royal Designers for Industry. He will be responsible for the administration of the panel's activities and of special design services associated with it. The panel will keep in close touch with the Commission's architect, but it will not itself be concerned with the architectural design of buildings or structures.

●

The first contracts, involving the design, supply and installation of the overhead conductor equipment, have been placed by the B.T.C. for the Manchester-Crewe and Colchester-Clacton 25*kv.* 50*-cycle a.c. electrification. To facilitate lowering of the track to obtain the necessary clearance for the new overhead equipment, the Styal line from Manchester to Crewe was closed completely between Wilmslow and Styal from October* 15 *to November* 23 *last. A crossover was laid on at Styal to turn the diesel units which maintained a shuttle connection with Manchester, while a bus service operated between Wilmslow and Styal.*

●

Today or tomorrow?

WHEN the British Railways modernisation plan was announced, one thought from what was said by the B.T.C. that experience had taught them the new equipment they were about to order would need a totally different approach from the methods used with steam ; that any attempt to marry operation or handling of new and old forms of equipment was unsatisfactory. Yet, from Sir Brian Robertson's recent address to the Institution of Mechanical Engineers, it tends to look as though the new motive power may start under the same old handicap. In what Sir Brian described as some "cautionary" words to his audience, he pointed out that existing maintenance facilities were designed for the steam engine and "our maintenance staffs are used to it. We are striving very hard at this time to ensure that as we receive new equipment so should we have ready new facilities for its maintenance. But everything cannot be changed overnight, nor everybody. Therefore the load on our maintenance staff must be made as light as possible, and we shall be bound to ask our suppliers and their design staffs to follow the principle that the more complicated the mechanism the more reliable it must be and the less maintenance it must require." Yet in his next sentence, Sir Brian was stressing

that his hearers "must not design for today but for tomorrow" ! How can the British locomotive industry, who regard these British Railways orders as so important in enabling them to develop new ideas that they can demonstrate practically to a world market, design for tomorrow if they are to be limited by the temporary changeover conditions of today ? And under the same restrictions, how can British Railways, already yards behind foreign systems in the race for modernisation, hope to catch up ? Incidentally, Sir Brian's implication that "everybody" is to have a hand in the maintenance of the new equipment is in striking contrast to the C.I.E. experience, that it is preferable to provide thorough training for a selected staff.

●

In the course of his speech, Sir Brian Robertson also disclosed that, in their effort to integrate the possibilities of road and rail transport, the B.T.C. is once again interested in vehicles that can operate on road or rail, and in the "piggy-back" method now popular in the U.S.A., whereby wheeled road trailers are conveyed over long distances on railway flat trucks.

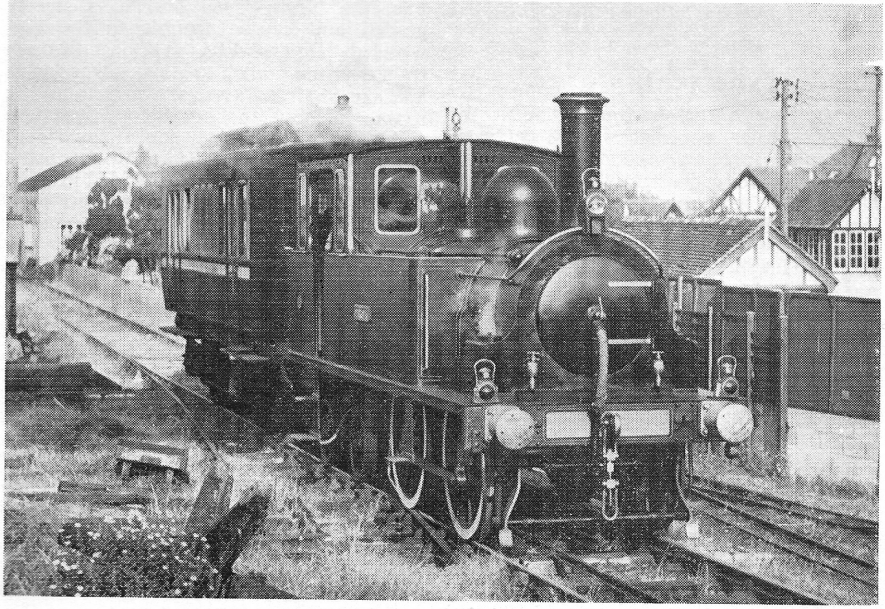
●

U.K. industry's good year

BRITISH locomotive manufacturers have been having one of their best years in 1956. A recent issue of the *Financial Times* reports that in the first half of the year 501 locomotives were turned out by private industry, 50 per cent more than in the same period of 1955 ; of this total 289 were exported, an increase of 82 per cent on the returns for the first half of 1955. Unfortunately, this high level of production is unlikely to be maintained, as British manufacturers have recently been unable to obtain contracts comparable with the large orders for main line locomotives won in 1954 and 1955. Foreign competition may have underbid British industry in some cases, but in general it seems that, despite a considerable flow of enquiries, there has been a slow-down in the rate at which foreign railways are renewing their motive power through difficulty in procuring the necessary finance or in settling of agreeable credit terms. To offset this decline, the industry now has on hand on the preliminary British Railways orders for main line diesel locomotives, and it is to be hoped that the development of the B.R. programme will result in the attraction of new world attention to the products of British industry.

●

Derby-built diesel railcars went into service between Manchester (London Road) and Buxton, Macclesfield and Crewe (via



★ For the first time since the arrival at New Romney, Kent, in 1950, the Duke of Sutherland's famous 0-4-4 tank *Dunrobin* of 1895 was steamed there on October 11. She spent a day running gently up and down the standard gauge track between the shed and the level crossing gates, and did not venture on to the nearby Southern Region branch. [*P. Ransome-Wallis*

★ A last glimpse of a North Tyne Valley train (see *this page*)—Class "3" 2-6-0 No. 77011 pauses at Reedsmouth with the 8.55 a.m. Hawick-Newcastle on October 13, 1956. [*J. W. Armstrong*

Styal) on October 8 last. At present they are operating in conjunction with steam services, which cope with rush-hour traffic. The diesel units are based on Longsight.

●

North Tyne trains axed

THE Scottish Region withdrew the North Tyne Valley passenger service between Riccarton Junction and Hexham (not Hawick, as we inadvertently wrote on page 473 of the October issue) on October 15 last. Mr. Sidney Teasdale writes that the chief reason for the withdrawal was that insignificant traffic carried by the trains did not justify the extensive repairs needed on the Border Counties bridge over the Tyne west of Hexham ; it is proposed, he adds, to continue the use of the branch from the northern end as far as Barrasford for goods traffic only, and the remainder, between Barrasford and the bridge, will be lifted. This ex-North British branch, Mr. J. D. Smith tells us, traversed thinly populated country, its chief passenger trade coming from Forestry Commission employees centred at Kielder. So poor were the prospects that the local 'buses gave up some years ago and the railway's only rival has since been a local taxi owner. Now a local coach operator is to receive over £3,000 per annum to run a 'bus service from Bellingham to the Waverley Route at Steele Road, and in return his receipts will be handed over to British Railways. Single throughout with station passing loops, beyond the junction with the main Newcastle-Carlisle line, the North Tyne branch is steeply graded and caused trouble to the big-wheeled "D49" 4-4-0s. The last through train over the branch to Hawick was run as an excursion from Newcastle on October 13 ; it was sold out an hour before departure and the six corridors hauled by "K1" 2-6-0 No. 62022 were filled to capacity, so that two more had to be added at Hexham for the additional passengers who joined there. The load proved a handful for the "K1," which was hampered by having to draw up twice at many stations beyond Hexham, owing to the length of the train ; restarting was tricky on occasion, and time was lost on the gradients. From Riccarton Junction to Shankend the outward train was banked by "J37" 0-6-0 No. 64539 ; on the return run, "D30" 4-4-0 No. 62440 proffered assistance from Hawick to Whitrope summit.

●

The London Midland Region withdrew the passenger train service between Rainford Junction and Ormskirk on and from November 5 owing to lack of traffic.

●

Branches in Bucks

ACCORDING to local newspapers, closure of the Princes Risborough-

Watlington branch is on the B.T.C. cards, we hear from Mr. R. W. Golder. Local people, he writes, maintain that one economy could be achieved by stabling the branch engine at Aylesbury, 16 miles away, instead of sending one up every day from Slough, so that two-thirds of its daily mileage is spent running light. The B.T.C. are reported to have turned down as uneconomical another suggestion that the service should be provided by a diesel railcar which could incorporate trips to High Wycombe and Aylesbury, replacing other steam auto-trains, with its Watlington branch duties. There is also a local request, based on the success of the new Banbury-Buckingham service, for a diesel railcar link between Aylesbury and Bletchley, using the spur from the G.C. route to the Oxford-Bletchley line at Claydon.

●

An interesting alteration has been made to the 1.0 *a.m. suburban train from Kings Cross to Gordon Hill, writes Mr. B. Perren. This now conveys passengers for Hertford North and Hitchin, and is the first regular train from Kings Cross to serve Hitchin as well as stations on the Hertford loop ; it will also be the first regular passenger train to use the section of the line from Hertford to Langley Junction since the train service was withdrawn some years ago. Hitherto, the* 1.0 *a.m. train has run forward from Gordon Hill to Hitchin as a staff train only.*

●

The new gas turbine

THE pulverised-coal-fired gas-turbine locomotive sponsored by the Ministry of Fuel and Power is nearing completion at the North British Locomotive Co.'s Glasgow works. This news was disclosed recently by Mr. T. A. Crowe in his presidential address to the Institution of Mechanical Engineers. The gas-turbine unit of this machine, which will function on the external combustion open cycle, has been constructed by Messrs. C. A. Parsons. The locomotive will be a 68-ft.-long giant of 150 tons weight, of which 80 tons will be available for adhesion ; it will be single-ended and of the 1A1A-A1A1 wheel arrangement, with a maximum speed of 72 m.p.h. and a starting tractive effort of 37,400 lb. Mr. Crowe also gave some details of the 2,000 h.p. diesel-hydraulic locomotives under construction for British Railways. Each will be 65 ft. long over buffers, compared with the 63¾ ft. of the Southern-built main line diesels, Nos. 10201-3, but will weigh less than the latter —110 tons as against 135 tons. They will be A1A-A1A type locomotives, each powered with two 1,000 h.p. North British M.A.N. diesel engines driving through the largest type of Voith transmission now in production, one capable of transmitting over 1,000 b.h.p. The new diesel-hydraulics will be designed for a maximum speed of 90 m.p.h. and have a starting tractive effort of 42,500 lb.

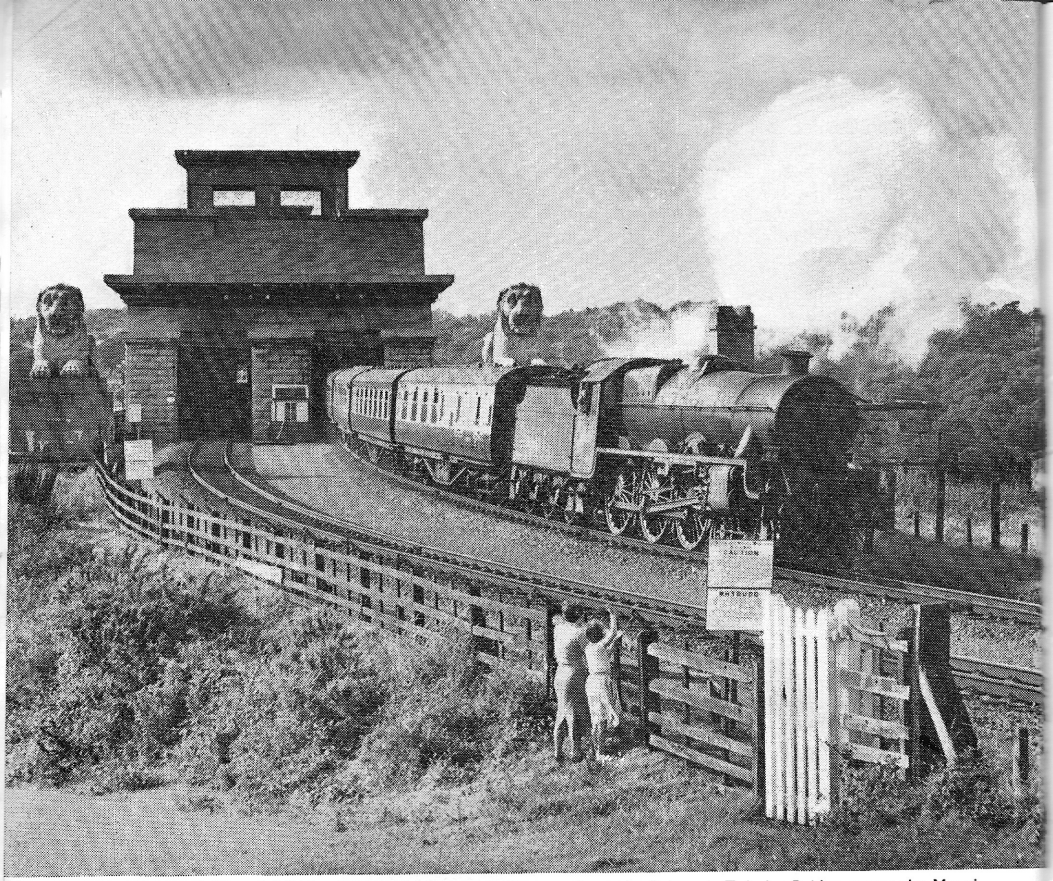
●

Last month we mentioned in our "Motive Power Miscellany" feature a report that, in conjunction with the B.T.C., Swindon works is considering the conversion of a "Castle" class 4-6-0 *to oil-burning. Possibly there is a connection between this item and news from Western Germany that the Federal Railways there have experimentally adapted a Class* "10" *Pacific to burn a heavy, high-viscosity residual oil that some refineries are regarding as practically a waste by-product of their processes.*

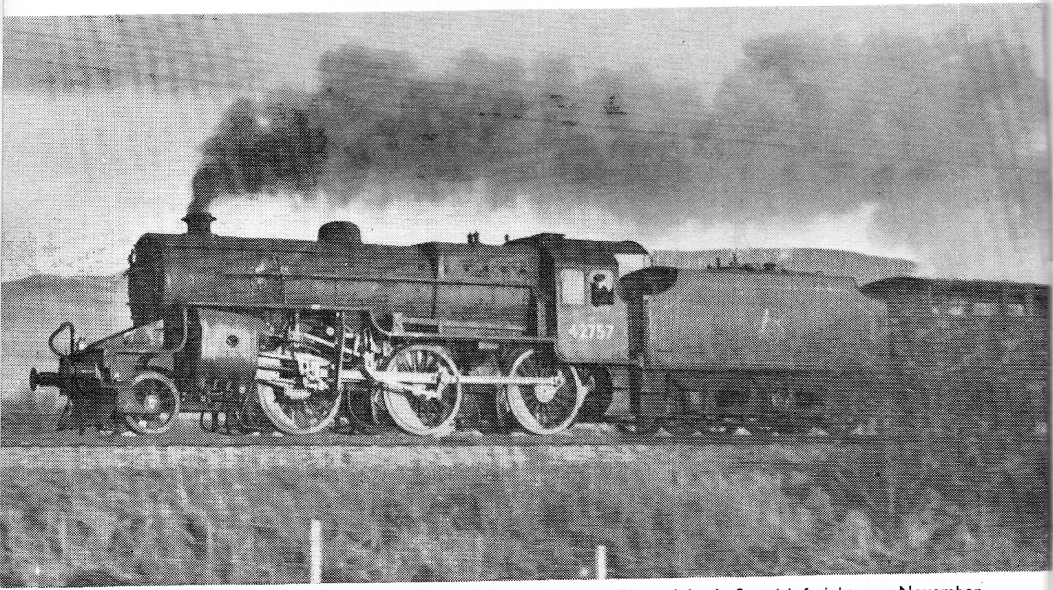
●

More Southern suburbanites

ODDLY enough, in view of the appalling weekday influx of cars to the capital, there is no diminution in the number of people travelling to London by Southern trains. In a recent address to the Southern Region Lecture & Debating Society, the Region's General Manager, Mr. Charles Hopkins, dealt with progress in Southern passenger services since this topic was previously discussed with the Society by his famous Southern Railway predecessor, Sir Herbert Walker, in 1929. At that time only 763 track miles of the Southern were electrified, but now the total is 1,782 and over them 40 million electric train miles are run annually, as against 18 million in 1929. Undoubtedly the Southern Railway's enterprising policy of electrification contributed to the substantial rise in the number of passengers carried during succeeding years. In 1956, revealed Mr. Hopkins, some 395,000 passengers are arriving at the Southern's London terminals every day, compared with 294,000 in 1929. Figures for the rush-hour traffic show a much more startling change ; whereas in 1929, 102,000 incoming passengers were handled in the morning peak hour, and 86,000 outgoing at night, today's figures are 171,000 and 166,000 respectively. To cope with this huge increase, the rush-hour service has had progressively to be intensified to the pitch where the tracks are so heavily occupied that no further additional services can be timetabled—the line is working to absolute capacity ; the only means to carrying more passengers are such expedients as the 10-car, instead of 8-car trains now being introduced, with the consequent necessity for an extensive programme of engineering works to remodel stations in order to accommodate them. An intensive service operating at such short headway, and the business of



★ "Jubilee" Class 4-6-0 No. 45603 *Solomon Islands* emerges from the Britannia Tubular Bridge across the Menai Strait with an express from Holyhead to the mainland. [*P. Ransome-Wallis*



★ "Crab" 2-6-0 No. 42757 pounds up Beattock bank with a northbound Anglo-Scottish freight on a November afternoon in 1953. [*W. J. V. Anderson*

clearing so many thousands of passengers at London stations, has the disadvantage of leaving a negligible margin for error ; a small delay at a suburban station can soon pile up far-reaching effects, while the rare major breakdown can play havoc.

●

If you're in the City of London with time in hand, make tracks for the Railway Tavern in Liverpool Street. The saloon bar and snack counter have been transformed into a miniature railway museum, with a delightfully executed décor of perfectly reproduced pre-grouping crests, paintings, photographs and some superb models, including the faultless ⅜ in. to 1 ft. scale L.M.S. "Duchess" by Mr. Cyril East, which took the championship award at the recent Model Engineer Exhibition. The food's good, too.

●

New "cars by rail" plan

ONE of British Railways most successful revenue-earning schemes of recent years has been the summer "Car-Sleeper" programme. A winter variant, introduced between Kings Cross and Edinburgh on November 5 last, offers businessmen car-carriage accommodation on the down "Night Scotsman" and the 10.20 p.m. up from Waverley ; motorists and their passengers will have the choice of travelling on the same train as their car, or on the 10.35 or 10.45 p.m. from Kings Cross, or 10.40 p.m. up from Edinburgh. Fares for the new service, covering both car and driver, are : £12 12s. 6d. single and £21 15s. return (first class) and £11 2s. 6d. single, and £18 15s. return (second class) ; additional passengers are charged at ordinary fares for the journey. The fares do not include sleeping accommodation, which must be booked and paid for separately. The new service continues until May 3 next, when the "Car Sleeper Limited" resumes operation.

●

The "Car-sleeper" idea has now crossed the Channel. On June 2, 1957, French Railways are introducing a thrice-weekly service, capable of carrying 90 cars per train on double-decker wagons, between Boulogne and Lyons. The outward train, leaving Boulogne at 8.52 p.m., will connect with the afternoon British Railways car ferry from Dover, and there will be a similar cross-Channel link with the return train, due into Boulogne at 6.36 a.m.

●

"Holiday Express" popular

THE Western Region achieved such encouraging results during the summer with touring holiday excursion trains arranged to coincide with the Industrial Holidays of certain towns that next year an even more ambitious programme will be arranged. The trains this year, by which stay-at-home holiday-makers went to different resorts on five successive days and still slept in their own homes, ran from Birmingham (Snow Hill), Bristol, Cardiff and Newport, Plymouth (North Road), Wolverhampton (Low Level), Dudley and Stourbridge. From Birmingham, 271 people were train companions for five days on visits to Barry Island, Llangollen, Bristol and Weston-super-Mare, at an inclusive five-trip fare of £3 10s. During the second week, 246 passengers visited the same places and individual daily trips were taken by 227 people. Bristol, for one week, provided 447 holiday-makers who visited Exeter and Paignton, Weymouth, Windsor and Eton, Bournemouth and Barry Island. Individual daily trips totalled 201. The fare for the five trips was £2 10s. For a second

BY THE WAY . . .

Southend Corporation and the Eastern Region of B.R. have been discussing the erection, possibly near Rochford on the Liverpool Street–Southend line, of a new station to serve Southend Airport. . . . The L.M.R. has begun to equip the toilets of its named trains with "Towelmaster" towelling cabinets in place of those uncomfortable paper towels, and we understand the Eastern Region is making a similar move ; the "Royal Scot" and "Red Rose" are already re-equipped. . . . New venture by the Southern Region on October 14 last was a cyclists' excursion from East Croydon via Redhill, Three Bridges, Hove, Lancing, Worthing and Chichester to the New Forest centre of Lyndhurst Road, and back some seven hours after arrival ; the train included a buffet car and three cycle vans. So popular was the idea that the S.R. may run more excursions of the same kind next spring. . . . C.I.E. is turning out new second class open coaches in an unpainted aluminium finish with the class numerals painted on the doors in red. . . . The prototype C.I.E. turf/oil-burning steam locomotive will be ready for trials by the end of 1956 ; it is reported to be a hefty machine, with a large boiler, and to show patent signs of descent from Mr. Bulleid's "Leader" venture for the Southern Railway. . . . The staff at Todmorden have shown what can be done to spruce up your station if it is so built that there is no place for a garden ; they have embellished their buildings with windowboxes and glass tanks of tropical fish, and have found room for a fountain and goldfish pond with a model of a water-wheel.

week's tour, which was equally well supported, Porthcawl, Portsmouth and Southsea, Bournemouth, Barry Island, Totnes and Dartmouth were the destinations. Holiday-makers from Cardiff and Newport were taken to Weymouth, Swansea and Mumbles, Windsor and Eton, Weston-super-Mare and London, and at £3 3s. for the five trips 401 people booked. The individual daily trip passengers totalled 205. The touring excursion from Plymouth, at five trips for £2, visited Ilfracombe, Falmouth, Dartmouth and Paignton, Penzance, and Exmouth. Passengers on this trip totalled 501, with no individual daily bookings. Wolverhampton, Dudley and Stourbridge holiday-makers paid £3 5s. for five successive journeys to Llangollen, Chester and Rhyl, Barry Island, Weston-super-Mare and Windsor. In addition to 104 passengers making the five consecutive outings, individual daily trips totalled 375.

●

On Saturday, October 20, *the Scottish Television Show train described in last month's issue visited Blackpool. With some* 500 *passengers aboard, it left Glasgow Central at* 8.5 *a.m. for Blackpool, arriving at the North Station at* 1.32 *p.m. The excursionists spent the afternoon and evening in Blackpool, seeing the famous illuminations, and returned from the North Station at* 12.15 *a.m. on Sunday morning. This closed-circuit Television Show train has been sponsored by a Scottish newspaper (the* Glasgow Evening Citizen) *in co-operation with Messrs. Pye Scottish Telecommunications.*

●

Sign of the times

FOLLOWING the recent retirement of the Southern Region's Carriage & Wagon and Chief Mechanical & Electrical Engineers, the Region has decided to amalgamate the two departments under the control of a new C.M. & E.E., Mr. W. J. A. Sykes, formerly the Southern's Assistant Electrical Engineer. The reason for this change is that the projected extension of multiple-unit stock usage on the S.R., largely by reason of its big electrification programme, but also through the introduction of diesel traction, will gradually reduce the distinction between the two former departments.

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More progress in the development of diesel-hydraulic transmission is reported from Western Germany. While the German Federal Railways' fleet of 2,200 *h.p. "V* 200" *diesel-hydraulic locomotives is being increased to* 55, *designers are working on a new twin-engine type for heavy haulage over steeply graded lines that will put out more than* 3,000 *h.p.*

New Harwich ferry

THE train-ferry Service between Harwich and Zeebrugge operated by British Railways was inaugurated in 1924 by three vessels constructed originally for military purposes during the 1914-18 war. The ferries were again employed for war work in the Second World War and two of them were lost ; thus only one remained to re-introduce the commercial service in August, 1946. The first replacement was made in 1947 when a more modern type of ship, the *Suffolk Ferry*, was brought into the service, and in 1951 a second new vessel, the *Norfolk Ferry*, followed. Finally the new *Essex Ferry*, completing the trio, was launched on October 24, at the Clydebank Yard of Messrs. John Brown & Co. (Clydebank) Ltd. by Mrs. C. K. Bird, the wife of the General Manager of the Eastern Region. The new ship will replace the old one of the same name, which is being renamed *Essex Ferry II* and used as a standby vessel. The annual tonnage conveyed by the Harwich-Zeebrugge service has increased by 50 per cent over the past five years. The ferry service is particularly useful for large pieces of machinery and fragile articles, also for perishable goods.

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From October 15 *last, the publishers of this Journal entered into association with the Locomotive Publishing Company, whose headquarters are now also at Craven House, Hampton Court, Surrey. Resultant changes will affect, amongst other things, the* Locomotive *magazine ; this periodical will shortly appear in a new style, but with its policy of reporting modern, world-wide developments in rail traction equipment and rolling stock in technical detail for the serious student unaltered and strengthened. Further information on this and other Locomotive Publishing Co. activities will soon appear in the advertisement columns of* Trains Illustrated.

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Ninety-nine not out

NOT only is this the last issue of another *Trains Illustrated* volume, but also its last in double figures, for next month's number will be our hundredth. There is special sentiment, therefore, in our good wishes to all readers for Christmas and the New Year, and in our thanks for your renewed interest and support during 1956. Despite the increased price forced upon us earlier in the year by the remorseless upward climb of costs, our circulation again moved upward (by 6 per cent) during 1956. Evidently our concentration chiefly on the contemporary railway scene and future trends is to your taste, and that policy will be developed further in 1957.

THE BRITISH TRANSPORT COMMISSION WHITE PAPER

British Railways state their case

IT is now a matter of years since British Railways fell among the back-markers in the rat-race of inflation. Prevented by restraint on capital investment from prompt action to make good the lack of wartime maintenance, they have found reserves put by at the time ill-matched with price levels in the 1950s, apart from the fact that the longer equipment is allowed to deteriorate, the more expensive it becomes to renovate in any event. In addition, the lengthy procedure imposed upon them before they can put into effect increases in fares and rates to meet higher costs has meant that, in an inflationary decade, they are always a stage behind in the upward spiral. As everyone knows, the railways' financial position has recently grown grave, and a position verging on the impossible was reached this year when, with no relaxation of their constitutional obligation ultimately to pay their way, they were bidden by the Government to restrict an application for higher rates (even though other nationalised industries soon afterward raised their charges), despite the obvious fact that the B.T.C.'s accumulated deficit was going to be swollen still further by the end of 1956. In fact, assuming no further increases in fares or charges, it will have soared from £70 millions at the end of 1955 to the unhappy total of £120 millions by the end of this year.

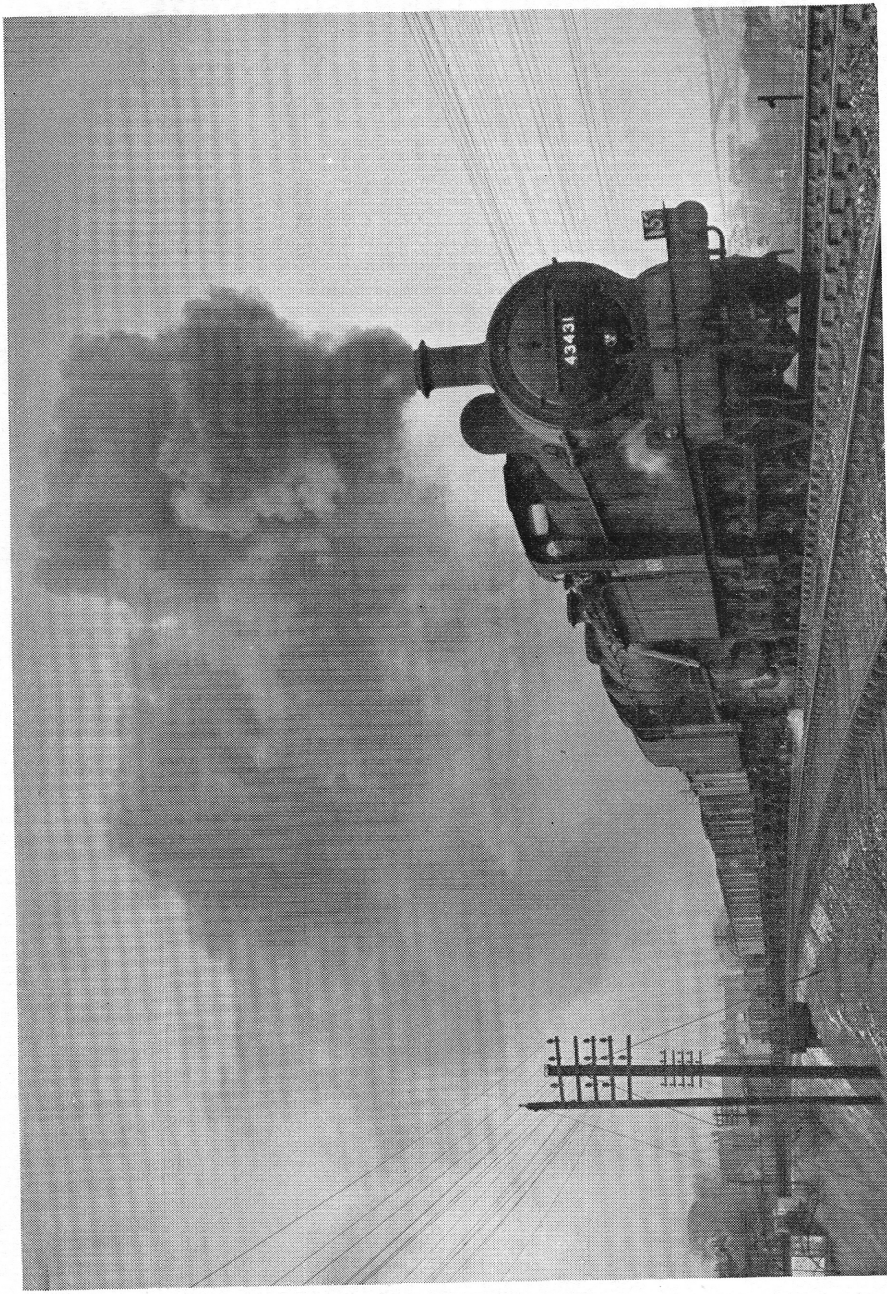
Clearly a reassessment of the Commission's position had become urgent, and in March last the B.T.C. was requested to present the Minister of Transport with a review of its present financial state and its future prospects. This it has now done, and its account was published at the end of October as a Government White Paper. The B.T.C.'s review does not prompt the Government to any alteration of the Commission's constitution or obligations, but to tide the B.T.C. over a difficult interim period it proposes to make advances up to (probably) £250 millions, to be repaid in due course, with interest. The B.T.C. is also to be empowered to borrow further, within limits, to cover the first three years' interest on sums required for capital expenditure in connection with the modernisation plan. Any idea of a straight subsidy by the State was rejected by the B.T.C. itself.

The Government has been influenced in its decision by the B.T.C.'s forecast that it should emerge from its present financial difficulties by 1962. This prophecy is based mainly on the growing benefits forthcoming from modernisation ; from elimination of, economies in, or modified methods of operating unremunerative services ; and from the greater realism and effectiveness of freight charges and services which should become possible under the new freight charges scheme. As a result, the B.T.C. hopes to balance its budget by 1961 or 1962, and by 1970 to have improved matters to the extent of achieving a surplus of about £50 millions a year, over and above the cost of servicing their capital (as opposed to a mere working surplus, which has been won annually so far). The B.T.C. is careful, however, to make its forecast contingent on a number of factors outside its total control—the stability of money value, and Government policy, for example ; freedom to adjust its charges without delay to meet any further cost increases, or to modify its services as it thinks best ; and the ability to pursue its modernisation programme as planned.

A large part of the White Paper is given over to a review of the measures to be taken and in prospect, by way of modernisation, economy and other means, to reach the hoped-for state of financial balance by 1962. This discloses a great deal of hitherto unpublished detail of British Railways' plans that is of considerable interest.

Construction of new steam locomotives will probably terminate early in 1958, with the completion of a further 84 heavy freight and 61 mixed traffic engines over and above the 1956 programme ; "few, if any, steam locomotives will be built thereafter," says the B.T.C. A matter on which the White Paper is silent, however, is what steps are being taken to nurse steam efficiently through its last decade or so.

The target dates for completion of the Eastern Region suburban and the Southern Region Kent Coast electrification schemes have already been published, but some additional dates are now disclosed for other conversions. The test section of the L.M.R. between Slade Lane Junction (Manchester) and Wilmslow is now expected to be ready by mid-1958 and the whole route between Manchester and Crewe a year later ; a tentative target of 1967 has been set for conversion of the whole main line between Euston, Manchester and Liverpool. The East Coast route from Kings Cross to York and Leeds is not expected to be



★Class "3F" 0-6-0 No. 43431 and Class "8F" 2-8-0 No. 48119 hammer away at the 1 in 132 grade near Mansfield (Midland) on a Shirebrook-Toton freight. Photographed on May 5, 1956. *[J. Cupit*

electrified before 1970, but the extension of the scheme on the former Great Eastern main line from Chelmsford to Ipswich, including the coastal branches (with the exception of the test section between Colchester and Clacton, due to be finished in mid-1958), should be ready by 1965. Target dates for the Glasgow suburban electrification are : North of the Clyde, 1960 ; and South of the Clyde, 1962. Prototype electric locomotives, now in the development stage, will be supplied by manufacturers in small numbers during 1958 ; thereafter, when the final designs have been settled, production will be stepped up rapidly to reach a peak of over 200 per annum during 1961.

The B.T.C. asserts that its electrification timetable is the best the combined capacity of the railways and private industry will permit. It budgets for the peak of the work to be reached in 1962, when the programme will involve the commissioning of about 1,000 electrified track miles and the placing in service of 200 electric locomotives and 900 electric multiple unit coaches per annum. After 1962 the B.T.C. will be in a position to contemplate new electrification works, and proposals for further extensions of the catenary are already under discussion.

The B.T.C. does not now expect to have the first of its 174 pilot scheme main line diesel locomotives available until the latter half of 1957. No large orders for additional main line diesels will be placed until the pilot types have been put through exhaustive trials and British Railways have settled on a series of standard types. By 1961, however, the B.T.C. expects to be ordering about 200 locomotives a year, and this level of construction is likely to be maintained for an indefinite period. Discussing the length of time necessary to complete the East Coast and West Coast main line electrification schemes, the B.T.C. remarks that "diesel traction will, to some extent, span the gap."

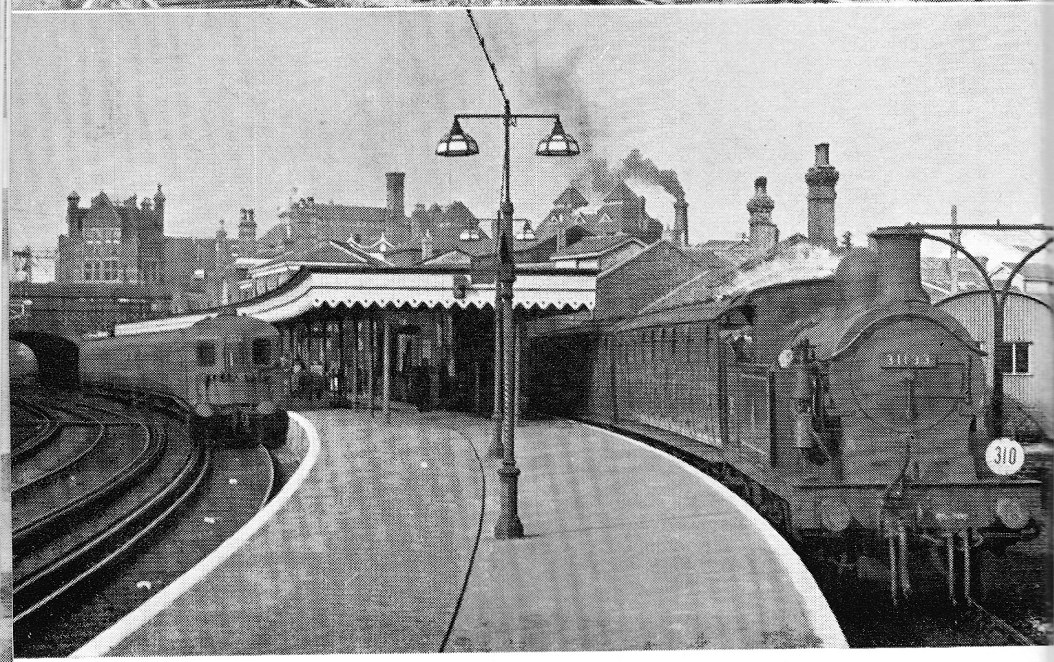
The White Paper does not specify what variety of diesel traction is in mind in this context. It may be the new high speed luxury multiple units, to operate on selected services between important cities and to "contain all that is best to offer for the comfort and amenity of the passenger," the planning of which is here revealed for the first time. The first of these is expected to enter service in late 1958, and their further introduction will depend on public reaction to them.

British Railways will need a total of 4,500 electric multiple unit vehicles for the conversions planned up to 1962, the majority of them of the open suburban type, and during most of the period production will be at the rate of some 900 vehicles per annum ; special attention, says the White Paper, will be paid to development of a high standard of riding quality in this multiple unit stock. The first prototype units for use on the 25 kv. a.c. electrified lines are expected to begin trials at the end of next year.

Over half—2,401—of the 4,600 diesel multiple unit vehicles envisaged in the modernisation plan will be in service by 1958, and the complete stock by the end of 1961 ; the accompanying table shows how the vehicles will probably be distributed at the close of 1958. The whole fleet, with the exception of those on the London-Hastings service, will be of the basic type already familiar ; the Southern units alone will be diesel-electric, the remainder employing mechanical or hydraulic transmissions. In addition, British Railways propose to order 20 light railbuses for extensive trials on rural branches up and down the country, starting next year ; of these

DISTRIBUTION OF DIESEL M.U. RAILCARS PLANNED BY JANUARY 1, 1959

Service	*Motor Cars*	*Trailer Cars*	*Total*
INTER-CITY			
Glasgow-Edinburgh ...	31	15	46
Birmingham-Swansea ...	12	6	18
Glasgow-Ayr-Girvan ...	44	22	66
WESTERN REGION SUBURBAN			
Bristol Area	20	10	30
London Area	28	14	42
South Wales	30	11	41
Cardiff Area	90	43	133
Birmingham Area	36	18	54
EASTERN REGION			
East Anglia	62	62	124
Norwich	37	37	74
Lincoln	37	37	74
Cambridge	25	25	50
Colchester	19	19	38
N.E. REGION			
West Riding	48	—	48
Newcastle/Middlesbrough/ Carlisle	44	42	86
Hull Area	31	31	62
York/Leeds/Scarborough	78	78	156
Co. Durham	62	62	124
Other schemes	63	39	102
L.M. REGION			
North Wales	7	7	14
W. Cumberland	18	14	32
Bury-Bacup	7	7	14
Birmingham schemes ...	82	58	140
Manchester schemes ...	206	117	323
Derby/Leicester/ Nottingham	34	17	51
WESTERN REGION			
Birmingham Area	36	18	54
Bristol	56	9	65
London	10	5	15
South Wales	62	29	91
Other schemes	31	21	52
SOUTHERN REGION			
London-Hastings	—	—	146
Hampshire	—	—	36
Grand total			2,401



ROUTES TO KENT

Above : S.R. "King Arthur" 4-6-0 No. 30765 *Sir Gareth* climbs away from Bromley South to Bickley Junction with a Victoria-Kent Coast express on July 27, 1955. [*B. E. Morrison*

Below : Class "H" 0-4-4T No. 31193 waits in the bay with the 3.20 p.m. to Tonbridge as an electric train from Cannon Street coasts into Maidstone West on March 17, 1956. [*P. J. Kelley*

vehicles, however, the chairman of the B.T.C. has warned that "experience elsewhere confirms our own, namely that too much must not be expected of such expedients *[to save unremunerative services from closure]*." In this connection, it is interesting to note from figures given in the White Paper the variation in response to the multiple unit diesel services already in operation ; compared with the previous steam trains, the Birmingham-Lichfield diesels have upped takings by 208 per cent, and the Bury-Bacup diesels by 164 per cent, but at the other end of the scale the improvement is only 30 per cent on the Kings Lynn-Wells-Norwich service and 44 per cent between Carlisle and Silloth.

In the next six years, about 7,700 new locomotive-hauled corridor coaches will be built. The first of the new standard coaches now in development will appear next year ; the White Paper states that in these new designs special attention has been paid to smooth riding, comfortable seating, attractive decor, heating, ventilation and lighting, reduction of noise, improved toilet facilities, and cleanliness. Altogether, the total of new coaching vehicles of all kinds to be built by the end of 1962 will reach about 20,000, while the 25,000 to be withdrawn by that time include all the remaining 14,000 wooden-bodied vehicles ; this involves a much higher rate of replacement of obsolete stock than in recent years. From all the projected developments in the passenger transport field, the B.T.C. expects to be £30 millions a year better off in 1962 than it is now.

The Commission does not expect to reap a financial benefit from the modernisation of its freight services quite so quickly, but ultimately its proposals in this field should better things to the extent of £55 millions a year. The main objectives for the modernised freight service are summarised as : reliability, speed, and economic operation.

The principal step to these aims, of course, is the fitting of continuous brakes to all B.R. freight stock. At present about 181,400 wagons—a sixth of the total fleet —is fitted, and in the next 10 years the total will increase by an average of some 60,000 annually, a third of this through new construction, the remainder by modification of existing stock. In addition, screw couplings and new buffers will have to be provided for existing stock, to enable them to be close-coupled ; about 150,000 of the larger mineral wagons of existing stock will have to be equipped with roller bearings to fit them for mile-a-minute speeds ; and arrangements will have to be made for the maintenance and testing of the vacuum brake equipment in marshalling yards and goods depots. All this work, the capacity of workshops to deal with it, and the amount of existing stock which can be released from traffic for modification at any one time, govern the rate at which the extension of continuous brakes to B.R. freight stock can be applied.

For the rest, British Railways plan new marshalling yards ; wagons of the highest convenient capacity (up to 50 tons, on suitable circuit workings such as the Tyne Dock-Consett iron ore run) ; a reduction of freight depots and the concentration of their business on modernised railheads, operated in conjunction with radial road services ; the increasing use of containers ; and possibly such devices to facilitate transfer of loads between road and rail without handling as the American "piggyback" method (*see* page 583). Amongst the sites of new railheads already planned are : Lincoln, Grimsby, Peterborough, Manchester, Stoke, Birmingham, London (Dudding Hill, on the Acton-Cricklewood branch), Crawley, Newcastle, Stockton, Dundee, Merthyr and Plymouth. By 1962, 1,600 diesel shunters will be in service and only 500 or so more will be needed to dispense entirely with the remaining steam shunting locomotives.

Within the next six years the B.T.C. expects to complete its pruning of unremunerative services and to save another £3 millions annually thereby. A further 20 services on the L.M.R. are slated for complete or partial withdrawal, involving $1\frac{1}{4}$ million train miles per annum, and in the near future cuts on the N.E.R. will dispense with another half-million train miles annually. Three branches likely to be closed on the Southern are termed marginal cases, and the B.T.C. comment suggests that they may be the last to be axed on this Region ; about 20 branches, however, are involved in a comprehensive review affecting 316 stations that is now under way on the W.R. The paragraphs dealing with the Eastern and Scottish Regions under this heading are more vague, except for a prophecy that within the next two years it is expected that diesel railcars will be operating on almost all the remaining E.R. branches, and for the definite news that the Scottish Region is to experiment with battery-driven railcars in conjunction with the North of Scotland Hydro-Electric Board. There is mention of a new approach to the question of dubiously profitable services in suburban areas—that of organising a co-ordinated road and rail schedule.

Discussing the civil engineering programme to fit its tracks for electrification and high speed running by the new motive power, the B.T.C. discloses that four electric rail welders have been ordered for delivery in 1957 and 1958, and that thereafter an extensive programme of long welded rails will be undertaken ; with the

elimination of the rail joint, track maintenance costs will be cut and smoother riding of trains will result. A special item is a heavy undertaking of bridge reconstruction, to catch up on wartime arrears that still remain owing to the post-war steel shortage ; every effort will be made to complete this work on the lines scheduled for electrification before conversion.

By 1962 A.T.C. should have been installed throughout between Kings Cross and Edinburgh, Euston and Glasgow (including Manchester and Liverpool), Edinburgh and Glasgow (by which route is not specified), Waterloo and Bournemouth, Waterloo and Exeter, and Liverpool Street and Norwich. No other new developments are reported in the remarks on signalling, and in particular there is no mention of any C.T.C. installations before 1962.

The B.T.C. has a word for the critics of its methods to date in the information that since 1948 the productivity per head, measured on a combination of passenger and freight carryings, of United States railroads has increased by less than 1 per cent per annum, despite heavy expenditure, whereas in Britain it has gone up by 2 per cent per annum. What modernisation here is likely to achieve is apparent from the French figure over the same period, which is 4 per cent. For its part the B.T.C. is promoting a wider and much more extensive application of the techniques of work study to all aspects of railway work, and a special training centre on this subject has been set up at Watford. A successful work study scheme has been introduced at Reading Signal Works, leading to increased output with reduced staff and a lower wages bill, but with increased individual earnings ; 29 other schemes have been implemented and 40 more are under discussion, including one covering much of Swindon works. Incentive bonus schemes for track maintenance work are producing good results on the Southern, and other Regions are taking note, while consultants are looking into the idea for adaptation to locomotive running shed maintenance work, amongst other possibilities. British Railways plan also to make extensive use of electronic equipment for all forms of computing, from wagon control to accounting. Altogether, they expect their measures to increase productivity to yield £5 millions a year by 1962.

As a result of objections to the B.T.C.'s new freight charges scheme before the Transport Tribunal, the railways' freedom to compete with other carriers has already been whittled down from what was anticipated. Although the Tribunal has accepted the general principle that henceforth British Railways should be able to quote charges related more to cost of handling rather than to value of the consignment, subject only to agreed maxima, and should be free to vary these charges according to circumstances, without publishing details, it has made a vital exception in respect of consignments weighing 100 tons or more and laid down a number of conditions which will hamper British Railways in competing for loads of a number of commodities normally carried in bulk.

Nevertheless, the B.T.C. considers that from what is left of their proposals the railways will still be in a better position to encourage bulk traffic in good wagon loads and regular traffic for which economical services can be arranged ; to regain a good deal of good-loading long and medium distance traffic from the roads ; and to cut their losses on some of the shorter distance rail traffic. The B.T.C. is fully aware that its present rates, both passenger and freight, are about as high as the traffic in a highly competitive world will bear, in most cases, and considers that it would be unwise to recoup its losses by higher fares and charges in the near future. On the other hand, the Commission does not hold itself to a general "price-freeze," but rather to a policy of price restraint ; there are, says the review, certain instances where local or selective increases are justified and should be made, and to this extent the B.T.C. should be free to adjust its charges as it sees fit. A case in point is London Transport, which, despite modern equipment, has failed to make an adequate contribution to the Commission's receipts since 1950 ; this results from causes, such as the increase of private motoring, which the B.T.C. is powerless to affect.

The Commission makes a special appeal for relief from other statutory obligations of long standing. For example, it is still committed to maintain, not only the structure of its road over-bridges, but the surface of the road approaches and on the bridge itself. Again, it would like to save some of the £1 million it now has to pay out annually to staff level crossings by substituting lifting barriers operated automatically through the track circuiting or remotely from the nearest signalbox, but while existing laws remain in force it cannot experiment with equipment of this kind.

From its freedom in charging policy and any other reliefs from statutory obligations it is likely to secure, the B.T.C. feels entitled to expect an annual benefit of £20 millions by 1962. Added to the benefits from other improvements already discussed, this makes an annual total of £63 millions more on the credit side by that date, a sufficient amount to balance the books. By 1970 it is anticipated that this improvement will have been all but doubled, and the B.T.C. should then be showing an annual surplus

(*Concluded on page* 606)

POSTSCRIPT ON THE

Somerset & Dorset 2-8-0s

SOME notes on the 2-8-0 locomotives of the Somerset & Dorset Joint Railway, supplementing the detail given by Mr. Ivo Peters in his article in the April issue, have reached us from Mr. H. E. Gulliford. He comments that engines Nos. 80-85 are said to have been ordered by the then Resident Locomotive Superintendent of the S. & D. J. R., Mr. Mervyn F. Ryan. Ryan, who was trained on the Midland Railway at Derby, was with the Pennsylvania Railroad at Altoona for some time before returning to England and joining the S. & D. J. R. He later went to the L.S.W.R. at Eastleigh, as assistant to the Chief Mechanical Engineer, R. W. Urie, and then, in 1917, he emigrated as Chief Mechanical Engineer of the Central Argentine Railway, eventually becoming Director-General of all the railways of Argentina.

The 2-8-0s were the first locomotives on the S. & D. system to be superheated, being fitted with the Schmidt apparatus, with the damper cylinder on the left-hand side of the smokebox. The dampers were removed about 1916-17. Features of the 2-8-0s new to the Somerset & Dorset were extended smokeboxes, steam reversing gear, mechanical lubricators, Belpaire fireboxes, tail rods, snifting valves, and Fowler-Anderson by-pass valves. Because of their 21 in. diameter, the outside cylinders were sloped to clear platform faces. The prototype 2-8-0s were equipped with three brake cylinders, which were useful for controlling heavy loads on falling gradients. The boiler used was the Midland (Fowler) G9AS Belpaire pattern, similar to those turned out for the Midland compounds and the "990" Class 4-4-0s.

Shortly after the arrival of the engines at Radstock Shed the chimneys were shortened, dome covers flattened, and cab-roof ventilators removed, as these fittings fouled the roof of the engine shed. Sliding cab-roof ventilators, similar to those of L.M.S. and B.R. standard pattern, were then fitted. Other alterations carried out by Mr. R. C. Archbutt (S. & D. Locomotive Superintendent at the time) were the replacement of screw-couplings by three-link pattern, the fitting of shorter buffer plungers, and substitution of gravity hand-sanding for steam-sanding gear.

The 2-8-0s' flat high-sided tenders were of Deeley design, with a wheelbase of 13 ft. 9 in., carrying 3,500 gal. of water and 7 tons of coal, and tablet-exchanging apparatus was fitted on both sides of the tender, as the engines could not be turned for some years. No. 53801 has recently acquired an ex-compound 4-4-0 tender with 13 ft. wheelbase and hinged doors to the coal bunker.

After 1925 screw reversing gear replaced the steam pattern, and the cab roof was extended rearwards to match that of the five similar engines built by Robert Stephensons in that year. Ross pop safety valves were fitted by the L.M.S. after it had taken the whole class into its stock in 1930, and screw-couplings and long buffers were restored. The original helmet-shaped covers to the wash-out plugs of the Belpaire fireboxes also were removed by the L.M.S. Engines Nos. 13802 and 13804 were fitted in 1932 with Kylala blastpipes and large diameter chimneys, but the apparatus was removed in 1934.

The 1925 Stephenson engines carried the standard Midland "G9BS" boiler, equal in diameter to that of the Lickey banker No. 2290, but shorter. These engines had screw reversing gear, Ross pop safety valves, and the (French) Lambert water sanding gear. Fowler standard high-sided L.M.S. tenders with 13 ft. wheelbase were attached, and some parts of the water pick-up gear were incorporated, with provision for the complete apparatus to be fitted later if desired. No spare boilers were made for these engines, and as spare "G9AS" boilers from scrapped compound 4-4-0s became available, the latter replaced the larger boilers as replacements became necessary. The copper firebox of No. 90 (now 53810) developed a fault at an early date, and the boiler was replaced.

The eleven engines of the complete class were given L.M.S. numbers in the L.N.W.R. series in 1930 (9670-9680), but as the construction of standard "7F" 0-8-0 engines (9500 series) overlapped this range, further numbers in the L. & Y. series were allocated (13800-13810), which later became B.R. 53800-53810. Alterations made by Stanier were the removal of Fowler-Anderson by-pass valves and pony-truck brakes, and fitting of new chimneys. The L.M.S. moved the snifting valves to a position on the footplating above the cylinders, but these returned to the original position after a few years. Steam sanding gear has recently been fitted to all eleven engines. Double-handed regulators and standard sliding firedoors are now used.

The L.M.S. Beyer-Garratts were based to some extent on the S. & D. 2-8-0s—the boiler, for example, was of the same length —and the Class "8F", "WD," and "Liberation" 2-8-0s were also developed from them.

LOCOMOTIVE RUNNING PAST AND PRESENT

High speed on the Western

by CECIL J. ALLEN
M.Inst.T., A.I.Loco.E.

IN my article of August last, I made reference to the work that Swindon has been doing lately, and with such outstanding success, in modifying the "Kings," first by the provision of four-row superheaters giving high temperature superheat and now by fitting double blastpipes and double chimneys. A run with one of these engines from Birmingham to Paddington was described, and since then I have had a journey on the down "Cornish Riviera Express," on which, with No. 6002 *King William IV*, there was a net gain of 17 min. from Paddington to Plymouth with 457 tare tons out of London (and 390 tons from Heywood Road Junction), and of 21 min. in the reverse direction with 391 tons throughout, with a coal consumption (excluding lighting up) that averaged no more than 42 lb. per mile. This was a pretty convincing testimony to the effectiveness of the changes that have been made.

Since then Swindon has applied the same principles to one of the "County" 4-6-0s, with equally encouraging results, and also to a "Castle"—No. 7018 *Dryslwyn Castle*—and here again an engine of outstanding performance has been turned out. As compared with the modified "Kings" and the "County," which have 250 lb. pressure, No. 7018 retains her normal 225 lb. ; as yet, also, this engine has no more than a three-row superheater compared with the four-row superheater fitted to other "Castle" class engines. But with the double blastpipe and chimney, as in the case of the other conversions, a perfectly even draught is obtained over the whole area of the fire-grate, which at the same time both produces the most lively steaming and also simplifies the work of firing. No. 7018 was chosen because it had a bad reputation for steaming, and this makes the result of the conversion all the more noteworthy.

By the courtesy of Mr. R. A. Smeddle, Chief Mechanical and Electrical Engineer, Western Region, I was permitted to have a most enjoyable trip in the dynamometer car with Mr. S. O. Ell, Assistant to the Chief Mechanical Engineer for Locomotive Testing, and his staff, on a run with the "Torbay Express" which formed one of a series of tests with *Dryslwyn Castle*. It was a perfect day in late July—actually two days before the ferocious gale with which that month closed—when I joined the 12 noon from Paddington, made up to nine bogies of 310 tons tare and 330 tons gross weight. The twin menaces to "Torbay" timekeeping are the heavy 11.55 a.m. from Paddington to South Wales, as far as Reading, and in summer the 11.30 a.m. from Paddington to Penzance, with stops at Reading, Newbury and Taunton, and a narrow margin ahead from Taunton to Exeter. This time the 11.55 certainly did its worst, but for reasons given later the 11.30 a.m., headed by the "Britannia" Pacific *Ariel*, did not worry us. The engine was in charge of Driver R. Way and Fireman Rutherford, of Newton Abbot, accompanied on the footplate by Locomotive Inspector W. M. Andress.

A clean start was made by No. 7018 from Paddington, and by Acton with the regulator now full open, the cut-off was back to 20 per cent, which, with a steady 750 h.p. at the drawbar and a pull of just under 2½ tons, accelerated the train to 62 m.p.h. at Southall. Then came the first two signal checks ; from these 25 per cent cut-off, gradually eased to 20, and a drawbar h.p. of about 850, produced a rapid acceleration from 48 m.p.h. just before West Drayton to 70 through Slough. But then followed much worse checks, particularly the long 10 m.p.h. slowing after Maidenhead and the 15 m.p.h. for permanent way repairs beyond Sonning ; by Reading we were 9½ min. "down" on schedule. From here on, however, we were destined to have only one more check—relaying again—and No. 7018 at last was able to show her paces, steadily regaining the lost time.

Recovery from Reading was at first on 30 per cent cut-off, brought back by degrees to 18 after Southcote Junction, and with the regulator not quite fully open, steam-chest pressure dropping at one point to 205 lb. Nevertheless we were doing a steady 64-66 m.p.h. up the gradual rise of the Kennet valley, increased to 69½ m.p.h. by Kintbury, but eased to 60 over Hungerford curve and to 46 for Grafton Curve Junction. Drawbar h.p. was round about 800 for most of the long climb. The Pewsey permanent way slowing brought us down from 70 to 13 m.p.h. ; from there on it was an uninterrupted "all clear."

To such an extent was this clear road utilised that instead of the scheduled 87½ min. for the 92.4 miles from Patney to Exeter, we took 76 min. 22 sec.—a gain of

over 11 min. ; the 63.6 miles from Patney to Norton Fitzwarren were run in 50 min. 22 sec., at an average of 75.7 m.p.h., including the climb to Brewham, which we topped at exactly 60 m.p.h., and the Castle Cary slack. Maximum speeds were 87 m.p.h. after Lavington, and 86 at Curry Rivell Junction. It was good to mount the 1¼ miles at 1 in 151 to Clink Road Junction at a minimum of 62 m.p.h. ; in the last 2 miles to Brewham, also, there is a mile averaging about 1 in 110. The cut-off along most of this high speed length was 20 per cent, and the drawbar h.p. in the region of 850. Of the lost time recovery, 6¾ min. was between Blatchbridge Junction and Taunton alone.

There was now considerable speculation in the dynamometer car as to where the 11.30 a.m. down might be, but it was soon set at rest, for as we swept past Norton Fitzwarren at 70 m.p.h., it was (with ill-concealed jubilation, I fear !) to see our hapless predecessor held in the down loop for us to get ahead. So we had an unhindered climb to Whiteball. Cut-off was advanced gradually from 17 per cent at Norton Fitzwarren to 22 by Wellington, where the speed up 2 miles at 1 in 174 had not fallen below 60 m.p.h. ; at the top of the 1 in 90 it was 52 m.p.h., of the 1 in 86, 48, and of the 1 in 81, 44 m.p.h., at which speed we threaded the tunnel. The maximum drawbar h.p. on the climb was 1,000, and the maximum cut-off 30 per cent. At the summit the boiler pressure had dropped to 205 lb., and the steam-chest pressure to 195 lb. ; but this is common practice to save the engine from blowing off on the ensuing descent.

The rest was easy, and we stopped at Exeter in 169 min. 48 sec. from Paddington, or 2¼ min. less then schedule. The net time from Paddington was 156 min. for the 173.5 miles, 16 min. less than that scheduled, representing a start-to-stop average of 66.7 m.p.h. from London. From Exeter, with all the usual slowings at Starcross, from Dawlish to Teignmouth, and at Newton Abbot, and with speed falling from 40 to 33 m.p.h. up the 2 miles at 1 in 110 from Kingskerswell, we ran the 26.2 miles from Exeter with the greatest ease in 33 min. 51 sec., instead of the 38 min. allowed, so arriving 4 min. early. With this moderately loaded train it would be a simple proposition to restore the pre-war 3½ hr. schedule in each direction between Paddington and Torquay, Exeter stop included. In normal day-to-day running, the coal consumption of the double chimney "Castle" on this train, excluding lighting up and steam raising, averages just under 36 lb. per mile, but on this run, due to the additional power demand in accelerating from out-of-course slacks and recovering the lost time, the consumption of the Welsh Markham coal used rose to an average of 43.7 lb. per mile —an interesting sidelight on the cost of high speeds.

★ W.R. double-chimney 4-6-0 No. 7018 *Dryslwyn Castle*, with dynamometer car next the tender, approaches Churston with the up "Torbay Express" on July 27, 1956. [*D. S. Fish*

TABLE I
W.R. PADDINGTON-EXETER
Engine: 4-6-0 No. 7018 *Dryslwyn Castle*
Load: 9 coaches, 310 tons tare, 330 tons gross

Dist.		*Sched.*	*Actual*	*Speeds*
miles		*min.*	*m. s.*	*m.p.h.*
0.0	PADDINGTON ...	0	0 00	—
1.3	Westbourne Park ...	4	3 18	33
5.7	Ealing Broadway ...	—	9 07	56
9.1	SOUTHALL	13	12 29	62
			sigs	*48
13.2	West Drayton ...	—	16 51	52
18.5	SLOUGH	21½	21 45	70
			sigs	*49
24.2	Maidenhead	27	27 35	54
			sigs	*10
31.0	Twyford	33½	39 35	59/62
			p.w.s.	*15
36.0	READING	38	47 35	40
37.9	*Southcote Junc.* ...	—	50 07	50
41.3	Theale	—	53 41	61
46.8	Midgham	—	58 47	64½
53.1	NEWBURY	56½	64 38	66/63½
58.5	Kintbury	—	69 25	69½
61.5	Hungerford	—	72 05	*60
66.4	Bedwyn	70	76 35	66/*46
70.1	SAVERNAKE ...	74	80 40	44
75.3	Pewsey	—	86 15	70
			p.w.s.	*13
81.1	Patney	84½	93 26	70
86.9	Lavington	—	97 50	86/87
91.4	Edington	—	100 58	84
94.6	*Heywood Road Junc.*	95	103 16	74
97.0	*Fairwood Junc.* ...	97	105 09	72
100.3	*Clink Road Junc.* ...	99½	108 05	62
102.3	*Blatchbridge Junc.* ...	101½	109 54	70
108.2	*Brewham*	—	115 06	60/77
111.7	Bruton	—	118 00	*71/76
115.2	Castle Cary	114½	120 48	*62
120.0	Keinton Mandeville	—	124 55	74/71
125.5	Somerton	—	129 19	78/74
130.8	*Curry Rivell Junc.* ...	—	133 10	86
134.7	Athelney	—	136 00	81
138.1	*Cogload*	—	138 26	78
142.7	TAUNTON	140½	142 07	71
144.7	Norton Fitzwarren	—	143 48	70
149.8	Wellington	—	148 32	60/62
153.6	*Whiteball*	152	152 55	44
158.6	Tiverton Junc. ...	—	157 14	82/78
160.9	Cullompton	—	158 47	83/*65
165.1	Hele	—	162 21	71
170.1	Stoke Canon ...	—	166 20	77
172.2	Cowley Bridge Junc.	170	168 07	—
173.5	EXETER	172	169 48	—

* Speed restriction

At Torquay I left the "Torbay Express," as I had to return to London the same day, and therefore took the 4.38 p.m. train, which is attached at Newton Abbot to the 1.20 p.m. from Penzance. I was fortunate in my day, as our engine, No. 6029 *King Edward VIII*, was manned by a very energetic Laira crew in the persons of Driver F. Hawkey and Fireman Mervyn Roper, whose work it was a pleasure to record. The load from Newton Abbot was twelve bogies, of 415 tons tare and 440 tons gross. Starting 3½ min. late, we had signal checks to Exeter, and between there and Taunton we were badly held up by a signal failure at Cullompton ; as a result of this and the almost inevitable overtime at Taunton waiting a connection, we were 11½ min. behind time from there. The run from Taunton appears in detail in Table II.

Time recovery began at once, and by Fairwood Junction 3 min. of the arrears had been wiped off. While the work over this stretch was not exceptional, it was uniformly good, particularly the 57 m.p.h. minimum up the 4¼ miles of 1 in 264 to Somerton Tunnel, and the 68 m.p.h. on the level at Edington. Rather unusually, we slowed to 58 m.p.h. at Fairwood Junction, the driver explaining to me that No. 6029 is inclined to be heavy on water, and he wanted to be sure of getting enough at Fairwood troughs. So all was going well until we sighted Lavington up distant at "caution." This was a second signal failure (I cannot help wondering if these casualties are more frequent on the Western Region than elsewhere, in view of the number of W.R. runs that I have known delayed in this way in recent months), and again all but brought us to a stand. It was at a bad place, too, just at the foot of the 5¾ miles at 1 in 222 to Patney.

On the climb we accelerated to 39 m.p.h., and with no further checks other than a 35 m.p.h. signal check from some unexplained cause at Hungerford, Driver Hawkey picked up a further 6½ min. from

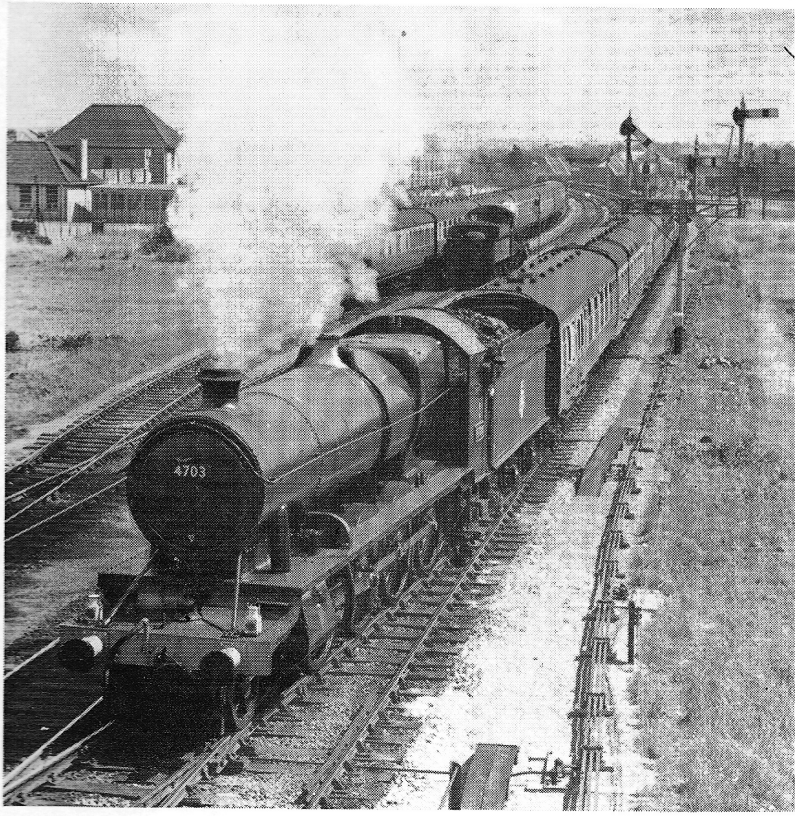
TABLE II
W.R. TAUNTON-PADDINGTON
Engine: 4-6-0 No. 6029 *King Edward VIII*
Load: 12 coaches, 415 tons tare, 440 tons gross

Dist.		*Sched.*	*Actual*	*Speeds*
miles		*min.*	*m. s.*	*m.p.h.*
0.0	TAUNTON	0	0 00	—
4.6	*Cogload*	—	6 47	59
8.0	Athelney	—	9 50	67/65
11.9	*Curry Rivell Junc.* ...	—	13 30	68
17.2	Somerton	—	18 36	57/66
20.5	Charlton Mackrell ...	—	21 46	61
25.4	Alford	—	26 14	69
27.5	Castle Cary	30	28 11	*60
31.0	Bruton	—	32 13	—
34.5	*Brewham*	—	36 37	34
36.3	Witham	—	38 47	—
40.4	*Blatchbridge Junc.* ...	45	42 16	74
42.4	*Clink Road Junc.* ...	47	43 59	66/69
45.7	*Fairwood Junc.* ...	50½	46 58	*58
48.1	*Heywood Road Junc.*	52½	49 24	61½
51.3	Edington	—	52 24	68
			sigs	*5
55.8	Lavington	—	58 18	—
61.6	Patney	66½	68 37	39
67.4	Pewsey	—	75 02	61
72.6	SAVERNAKE ...	78	80 29	53
76.3	Bedwyn	82	84 16	68/70½
			sigs	*35
81.2	Hungerford	—	89 22	—
84.2	Kintbury	—	92 50	65
89.6	NEWBURY	95	97 32	76½
95.9	Midgham	—	103 02	*58
101.4	Theale	—	108 11	69
104.8	*Southcote Junc.* ...	—	111 34	*44
106.7	READING	115	114 19	*40
111.7	Twyford	121	120 07	61½
118.5	Maidenhead	128	126 17	67
124.2	SLOUGH	134	131 17	70½
129.5	West Drayton ...	—	135 52	66
133.6	SOUTHALL ...	143	139 39	66
137.0	Ealing Broadway ...	—	142 37	—
139.4	*Old Oak Common* West	—	144 54	—
141.4	Westbourne Park ...	151	147 27	—
142.7	PADDINGTON ...	155	150 52	—

* Speed restriction

Above : W.R. "King" 4-6-0 No. 6024 *King Edward I* carries Dainton summit with the 2 p.m. Plymouth-Paddington express and begins the descent to Newton Abbot on July 31, 1956.

[T. Lewis



Right : Mixed traffic 2-8-0 No. 4703 eases an excursion from Swindon into Weston-super-Mare on August 12, 1956.

[W. N. Lockett

TABLE III
W.R. OXFORD-PADDINGTON

Dist.	Run No. ... ... / Engine: "Hall" 4-6-0 No. / Load (tons tare) ... / Load (tons gross) ...	Sched.	1 — 7902 — 182 — 195		2 — 6990 — 186 — 200		3 — 6974 — 198 — 210		4 — 7904 — 198 — 210		5 — 7902 — 199 — 210	
miles		*min.*	*m. s.*	*m.p.h.*	*m. s.*	*m.p.h.*	*m. s.*	*m.p.h.*	*m. s.*	*m.p.h.*	*m. s.*	*m.p.h.*
0.0	OXFORD ...	0	0 00	—	0 00	—	0 00	—	0 00	—	0 00	—
2.4	*Kennington Junc.* ...	—	3 51	55	3 49	57	4 00	55	4 12	54	3 53	58
5.1	Radley	—	6 25	68	6 24	67	6 37	66	6 51	65	6 19	71
7.3	Culham	—	8 12	77/81½	8 24	72	8 30	74½	8 46	72/76	8 06	74/77
9.7	*Didcot N. Junc.* ...	10	10 07	*64	10 30	*67	10 42	*54	10 48	—	10 09	*62
10.5	*Didcot E. Junc.* ...	11½	11 05	*45	11 25	*50	11 49	*38	11 53	*39	11 03	*50
14.9	Cholsey	—	15 18	75	15 40	71	16 29	71	16 43	68	15 08	76
18.6	Goring	—	18 10	80/79	18 44	73/74	19 21	81/80	19 42	77	17 58	79
21.8	Pangbourne ...	—	20 32	83	21 23	72	21 43	83	22 10	80	20 29	76
24.7	Tilehurst	—	22 34	88	23 37	81	23 50	82	24 20	81	22 43	78
27.4	READING ...	25½	24 21	85½	25 37	75	26 04	*69	26 16	79	24 47	74
32.4	Twyford	29½	27 48	86	29 27	79	30 02	81	30 03	80	28 44	77
39.1	Maidenhead ...	35	32 45	80	34 32	80	34 51	85/86	35 00	83	33 41	85
45.0	SLOUGH	39½	37 16	76½	39 00	75/72	39 00	83	39 15	81	38 01	80
50.2	West Drayton ...	—	sig stop 46 06	63	43 16 sigs	76 *55	42 48	82	43 14	77½	42 04	78/76
54.3	SOUTHALL ...	46½	49 45	74	46 46	—	45 55	77½	46 29	76	45 19	78
57.7	Ealing Broadway	—	52 30	72	49 43	73	48 35	74½	49 04	79	48 02 sigs	65 *52
60.1	*Old Oak Com. W.*...	—	54 27	76½	51 35 sigs	79 *33	50 37	69	50 58	73	50 35	—
62.1	Westbourne Park	55	56 08	*55	53 49	—	52 44	*47	52 59	*40	53 19 sig. stop	*38
63.4	PADDINGTON ...	60	58 45	—	56 29	—	55 20	—	55 39	—	57 47	—
63.4	Net times (min.) ...	60	54	—	55½	—	55¼	—	55¾	—	54¾	—

* Speed restriction. Engine names: 6974 *Bryngwyn Hall*; 6990 *Witherslack Hall*; 7902 *Eaton Mascot Hall*; 7904 *Fountains Hall*.

Savernake to Paddington. Top speeds were 76½ m.p.h. at Newbury, and 70½ on the level through Slough, and all speed restrictions were carefully observed. So we ran into Paddington just over 7 min. late, having taken 150 min. 52 sec. for the 142.7 miles from Taunton, as against the 155 min. allowed. The Lavington check had cost fully 6½ min., and that at Hungerford 1½ min., leaving a net time of 143 min., or 12 min. less than schedule, which means, of course, that but for the unfortunate Lavington delay, our crew would have picked up all the arrears and arrived to time.

In Table III we come to a train which is of note, not so much by reason of its scheduled speed, but because of the type of locomotive which almost invariably works it. The vast improvement in front end design, and in particular in the reduction of back pressure in the cylinders, which has stemmed from the introduction of Churchward principles on the G.W.R. in the first decade of the present century, has made us accustomed to high speeds with small-wheeled engines. Today maxima of between 80 and 90 m.p.h. have become common with locomotives such as the 6 ft. 2 in. Bulleid Pacifics of the Southern Region, the Eastern 6 ft. 2 in. "A2" Pacifics and "V2" 2-6-2s, and the 6 ft. Class "5" 4-6-0s because these, though classed as "mixed traffic" engines, have been used indiscriminately on express passenger and fast freight services. But on the Western Region the dominance of "Kings" and "Castles" over most of the faster passenger workings hitherto has not brought the 6 ft. "Hall" 4-6-0s into similar prominence in the speed realm.

We have known very fast runs made by "Halls," of course, such as the immortal occasion on which *Fountains Hall* took over at Little Somerford no less a flyer than the "Bristolian" from a "Castle" which had failed, and ran the 77.3 miles from Swindon to Paddington in 59 min. 37 sec., sustaining a speed of 80 to 84 m.p.h. virtually on the level over the 47.2 miles from Wantage Road to West Drayton. But this has been the exception, whereas the working of the recently accelerated 5.35 p.m. from Oxford on its 60 min. run over the 63.5 miles to Paddington is now the daily task of a "Hall," on which a sustained speed of 80 m.p.h. and over has become the rule. The table sets out five runs on this train, chosen out of a number timed by Messrs. P. G. Barlow and H. G. Ellison, who use it regularly. The engine is usually an Old Oak "Hall," manned by an Oxford crew, though at times by Old Oak men; never previously, in all probability, has Oxford shed had anything so fast to handle, and it is evident from the runs described that the Oxford men have taken to their unaccustomed task with enthusiasm.

The runs speak for themselves, and need

TABLE IV
W.R. SWINDON-PADDINGTON
6-car diesel set, 1,200 h.p.

Dist.		Sched.	Actual	Speeds
miles		min.	m. s.	m.p.h.
0.0	SWINDON	0	0 00	—
0.9	Highworth Junc. ...	—	2 16	—
5.7	Shrivenham	—	6 50	70½
10.8	Uffington	—	11 03	71½
13.4	Challow	—	13 17	71½
16.9	Wantage Road ...	—	16 08	71½
20.8	Steventon	22	19 25	71½
24.2	DIDCOT	25½	22 13	71½
28.8	Cholsey	—	26 10	70½
32.6	Goring	—	29 15	69
35.8	Pangbourne ...	—	31 57	70½
38.7	Tilehurst	—	34 25	71½
			sigs	*5
41.3	READING	42	39 52	—
46.3	Twyford	46½	44 18	71½
53.1	Maidenhead	53	49 59	71½
58.8	SLOUGH	58½	54 56	70½
64.1	West Drayton ...	—	59 20	71½
68.2	SOUTHALL	68	62 51	70½
71.6	Ealing Broadway ...	—	65 39	71½
74.0	Old Oak Common West	—	67 42	70½
75.3	Milepost 2	—	68 54	62
			sigs	*20
76.0	Westbourne Park ...	76	70 06	—
77.3	PADDINGTON ...	80	73 28	—

* Speed restriction

little in the way of description. From Oxford the gradients very slightly favour the engines as far as Appleford, just short of Didcot, from which there is a slight rise to Didcot East Junction. Here a speed restriction of 40 m.p.h. is laid down for crossing over to the up fast line.

The load of this express is light, not exceeding six bogies, with a gross weight of 200 tons or slightly over. On Run No. 1 *Eaton Mascot Hall* was manned by Old Oak Driver Noble and Fireman E. Mitchell. This created a record in that 81½ m.p.h. was attained in the first 8 miles ; no other driver got higher than 77 m.p.h. here. Thus the exacting 11½ min. for the first 10.5 miles, to Didcot East Junction, was actually improved on by nearly ½ min. After the slack here, 80 was re-attained by Goring, and held nearly to Slough, with a maximum of no less than 88 m.p.h. at Tilehurst and again of 86 beyond Twyford, and an average of 82.7 m.p.h. over the 30.1 miles from Cholsey to Slough, where the train was 2¼ min. early. Then came a signal stop at Dolphin Junction, notwithstanding which time was kept, with 1¼ min. to spare. The net time of 54 min. for the run, representing a net start-to-stop average of 70.6 m.p.h., was the fastest of the series.

Driver Hayes of Oxford was in charge of *Witherslack Hall* on the second run. There was a signal check at Hayes on this trip, followed by a rapid acceleration from 55 to 79 m.p.h. by Old Oak Common ; notwithstanding a second signal check, at Westbourne Park, time was kept with 3¼ min. to spare. In column 3 *Bryngwyn Hall*, with Driver S. Newton and Fireman M. Williams of Old Oak, had a clear road throughout, and reached Paddington over 4½ min. early. This run had a maintained average of precisely 80 m.p.h. over the 42.8 miles from Cholsey to Ealing Broadway, including a rather unusual easing to 69 m.p.h. through Reading, possibly due to signals.

On Run 4, Old Oak "Hall" No. 7904 *Fountains Hall*, hero of the "Bristolian" exploit already mentioned, was manned by Driver Williams and Fireman Incker of Oxford, and the performance closely resembled that of the previous run, with no greater divergence than 34 sec. at any point. On the fifth run we come back again to the work of *Eaton Mascot Hall*, a sprightly performance with Driver Brookings and Fireman Mead of Oxford, on which 85 m.p.h. was touched at Maidenhead, though elsewhere the speeds were slightly lower than on the preceding trips. It was the second journey of the series on which time was more than kept despite a signal stop, but in this case not until between Westbourne Park and Paddington. With the help of the very fast start from Oxford, the net time for the run was 54¾ min. only.

As an interesting supplement to the foregoing, I may mention a run with No. 6990 *Witherslack Hall*, in charge of Driver F. Mason and Fireman Incker of Oxford, which was timed by Mr. R. I. Nelson from the footplate, and reveals that with a "Hall" this train can be worked, apart from starting and recovery from slacks, on 20 per cent cut-off and for much of the distance on the first valve of the regulator. These positions produced from 73 to 78 m.p.h. from Cholsey to Maidenhead, when a partial opening of the main valve of the regulator, with cut-off unchanged, brought the speed up to 85 m.p.h. through Slough. On this run a 15 m.p.h. permanent way slowing after Radley made the train 3¾ min. late past Didcot East ; the lateness had been reduced to 1 min. by Southall, and despite a concluding signal check Paddington was reached in 12 sec. over the allotted 60 min., or 56 min. net.

A few months ago I had the privilege of accompanying the Press party on the demonstration run from Swindon to Paddington of the first of the diesel train sets which has been built at Swindon Works for service between Edinburgh and Glasgow. These are governed for a maximum speed of 70 m.p.h. ; why, it is not easy to say, seeing that one of the major advantages of diesel traction is the capacity of the diesel engine for sustained high speed, but so it is. Out of Swindon we were up to the 70 m.p.h. level in no more than 4 miles from the start, and from then on the precision of the running was quite remarkable. On the very

(*Concluded on page* 616)

The Tweedside Line

by C. J. B. SANDERSON

AS has become customary, British Railways performed their annual ceremony of wielding the economy axe on a number of branch lines and small, unremunerative country stations in 1955. Amongst those affected was the Tweedside line of the North Eastern and Scottish Regions, whose passenger train service was reduced from four to two trains per day each way, while five stations on the twenty-two mile stretch between Tweedmouth and Kelso were closed to passenger traffic. These were Velvet Hall, Twizell, and Sunilaws on the North Eastern Region and Carham and Sprouston on the Scottish Region. The Transport Users' Consultative Committees for both the North Eastern and Scottish Regions, as well as the County and District Councils concerned, agreed to this re-organisation as alternative road services are available.

The lower stretches of the valley of the River Tweed attracted the promoters of railway schemes for many years. As early as 1805, Thomas Telford, the famous builder of roads and canals, was authorised to make a survey of the area as part of a scheme for a railway from Glasgow to Berwick. This line was to run through Lanark and Dolphinton, and then along the north side of the Tweed through Peebles, Melrose, Makerstoun and Swinton, and was to be worked by horses. Nothing became of the scheme at the time, but much of the area is now served by railways built on, or very close to, Telford's original route.

In 1811, the Berwick & Kelso Railway Company obtained an Act of Parliament to build a railway from Kelso down the Tweed Valley to the small port of Spittal, about 24 miles away. Amongst the proposed railway schemes of its day, the Berwick & Kelso Railway is of special interest for two reasons ; firstly, it was intended to serve an area that was purely agricultural, and had no coal mines or heavy industries—or even the prospect of them—from which it could obtain traffic like other railways of that period : and secondly, it was the first railway ever to obtain, in its original Act, a clause which referred to the conveyance of passengers. It could never, of course, have been the first railway actually to carry them, for the Swansea & Mumbles Railway gained that distinction on March 25, 1807, but the original Act for the latter, which was granted in 1804, was for a goods line only, and permission to carry passengers was obtained by a subsequent Act.

Though the scheme for the Berwick & Kelso Railway was rather more daring than others of that period, nothing serious was done at the time to get it started, and it lay dormant for fifteen years. Then, in 1826, some of the original proposers—together with other interested Border gentlemen, one of whom later became famous as Sir Walter Scott of Abbotsford—made an attempt to get their Act of 1811 carried out, and have the line built. They also suggested that it should be continued westwards from Kelso, up the Tweed valley to Melrose, and then northwards over the Lammermuir Hills to join up with the Edinburgh & Dalkeith Railway, which had just been authorised. However, there were several setbacks, the one which affected the B. & K. most being the fact that some Kelso landlords refused to permit the line to pass through their land, and as a result of this the project had to be dropped. In the boom year of 1836, the Committee of the Border Association resurrected the proposal, in order to encourage agriculture in the area, but the Company was already moribund and was finally dissolved in 1838.

Seven years later, on July 31, 1845, the Newcastle & Berwick Railway—which became the York, Newcastle & Berwick Railway in 1849, and subsequently the North Eastern in 1854—obtained an Act of Parliament to build a line, 22 miles long, up the southern side of the valley of the Tweed from Tweedmouth, at the northern extremity of their main line, to Kelso. The first section of 20 miles, to the village of Sprouston, was opened for traffic on July 27, 1849. In the meantime, the North British Railway, which had reached Berwick via Dunbar in 1845 and, having taken over the powers of the Edinburgh & Hawick Railway, was meeting stiff opposition from the Caledonian Railway in its attempts to reach Carlisle and thus gain control of the whole of the south-east of Scotland, obtained powers in 1846 to build 10½ miles of line from St. Boswells, on the route to Hawick, down the Tweed valley to Kelso. The N.B. line to Hawick was completed in 1849 and the branch to Kelso in June, 1850. This terminated at a temporary station about three-quarters of a mile west of the town, but six months later it was extended by one mile to Maxwellheugh, where the present Kelso station is situated, though the town itself is built round the abbey on the

lower ground on the north side of the river.

On June 1, 1851, both the North Eastern and the North British extended their branches towards one another to form an end-on connection at Mellendean Burn, about 1¼ miles east of Kelso station. The 3¼ miles of track between the Border, about 400 yards east of Carham station, and Mellendean, together with Carham and Sprouston stations, were the only railway property in Scotland totally owned and worked by an English railway company. In comparison it is interesting to note that the Scottish railway companies had about 140 miles of track in England, the N.B.R. owning by far the largest part of this—about 122 miles. When nationalisation of the railways took place in 1948, the Scottish Region took over both Sprouston and Carham stations and became responsible for the line right up to the Border, though in L.N.E.R. days the Scottish area stopped at the limit of the old N.B. line.

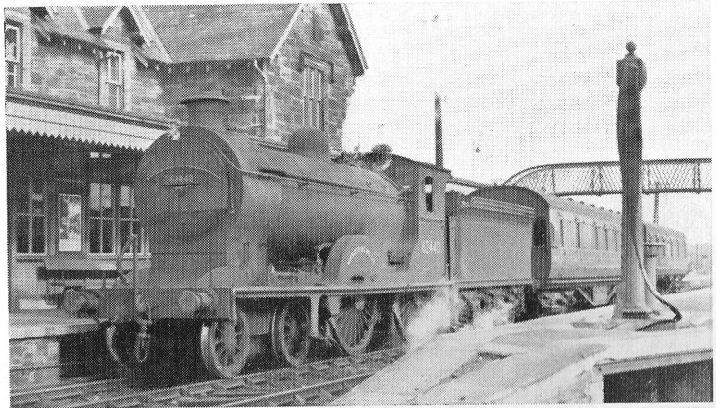
The Tweedside line runs through a narrow belt of rich farming land between the river and the Cheviot Hills ; away to the north lies the Merse of Berwickshire with the Lammermuir hills beyond. The North Eastern stretch is fairly easily graded, but has some difficult bends and is double track ; from Kelso westwards, however, the gradients are both longer and steeper and the line is now only single track, the other track having been lifted in, or about, 1932. For many years the line has been regarded as being part of an alternative route to Newcastle in event of accidents on the East Coast main line between Edinburgh and Berwick. After the disastrous floods in Berwickshire in August, 1948, when seven bridges on the main line were swept away, all East Coast main line trains were diverted over the Waverley Route to St. Boswells and then down to the Tweedside line to Tweedmouth for a period of about three months. This route is only about five miles longer than the main line via Dunbar, but it is a much more difficult road for the footplatemen, with several speed restrictions, and consequently it takes much longer.

I last travelled over the line from Berwick to St. Boswells on a Saturday morning late in June, 1955. The train consisted of two non-corridor coaches, weighing about 59 tons, and was hauled by ex-N.B. 4-4-2 tank No. 67495 of Hawick shed. By departure time it was well filled, and sharp on time, the guard blew his whistle and we were off, crossing over from the down to the up line on leaving the platform and then taking to the Royal Border Bridge. As the Tweedside line leaves the main line by means of a facing junction from the south between Tweedmouth station and the bridge, the St. Boswells trains have to run right through Tweedmouth station to a point just opposite the Tweedmouth locomotive sheds, where the engine runs round the train and then draws it back into the down platform loop, which serves both east and westbound branch line trains. Berwick-bound branch trains run straight into this platform, the engine running round the train in the platform ; the timetable allows six minutes for this performance. Having picked up its passengers, or in this case, dropped them, for a lot of people got off at Tweedmouth, our train, with the engine at the other end and no longer running bunker first, swung out on to the branch.

The first two miles are slightly downhill and No. 67495 bowled along nicely through the flat fields beside the river. The line then turns south-west and begins to climb gently to Velvet Hall, the first station on the line, four miles from Tweedmouth. This is a typical North Eastern country station, with dressed stone station buildings on the down platform, a wooden shelter on the up platform, and a small goods yard on the west side, but like so many stations on this line it is fairly far away from any village. The station is built on a slight curve and at the top of a gradient of 1 in 176, but this soon changes to a fall of 1 in 200 for about a mile.

The line rises and falls again on similar gradients until Norham—six miles from Tweedmouth—is reached. With no passengers here, the train made a quick get-away, with gradients in its favour, through wooded farming land for a further three and a half miles to Twizell. This is rather a dilapidated station built on the wooded banks of the Tweed, but nowhere near any place of habitation. For the next two miles the train runs close to the river, and then turns away to Coldstream, the biggest station on the line so far, and just over twelve miles from Tweedmouth. Although called Coldstream in the timetable, this station is really Cornhill-on-Tweed, as the burgh of Coldstream is over the river in Scotland. It is a tidy, compact station, with a large goods yard, and it serves a large agricultural area. Very shortly after leaving Coldstream, a single-line branch swings off to the left, while the Kelso line turns away westward again and rises to run along the side of Wark Common. This single line, 35 miles long, is the North Eastern line to Wooler and Alnwick, authorised in 1882 and opened in 1887. Passenger traffic was withdrawn on September 2, 1930, and, due to flood damage in 1948, this line is now only open from the north for goods traffic as far as Wooler.

At the next station, Sunilaws, 15¾ miles from Tweedmouth, our train met the one from St. Boswells to Berwick, consisting of three non-corridor coaches and hauled by the Tweedmouth passenger engine on the line, a Class "J39" 0-6-0, running tender-



STATIONS ON THE TWEEDSIDE LINE

Top left : Kelso, with Class "D30" 4-4-0 No. 62440 *Wandering Willie* at the platform heading a St. Boswells train on September 25, 1954. [*L. King*

Bottom left : Roxburgh Junction, with the Kelso-Tweedmouth line veering left and the Jedburgh branch on the right. [*C. J. B. Sanderson*

Top right : Another view of Kelso, with Class "V1" 2-6-2T No. 67659 in the bay on the 4.5 p.m. St. Boswells-Kelso-Berwick, which had set back to pick up a van on September 15, 1956. [*N. R. Knight*

Bottom right : Sprouston, looking towards Tweedmouth. The old locomotive shed is to the left of the water tank at the other end of the station. [*C. J. B. Sanderson*

first. Sunilaws, which again is rather out in the wilds, is built on a curve and a slight gradient, which steepens considerably for a further three-quarters of a mile to milepost 17, after which the line falls almost all the way to Kelso. The line is now on higher ground and a wonderful view of the river, the Merse of Berwickshire and the Lammermuir hills beyond, is laid out before the traveller. Just before milepost 18 the train passes through a strip of trees and crosses the border into Scotland (contrary to popular belief, the River Tweed does not mark the border between England and Scotland for any great distance); the exact point is marked by a large sign on each side of the line.

Just inside Scotland is Carham station (18¼ miles). Like so many North Eastern country stations with a level-crossing, Carham has the up and down platforms on opposite sides of the roadway, a feature which was very uncommon on Scottish railways incidentally. However our train does not stop here but continues on for a further mile and a half over falling gradients to Sprouston, which was originally the terminus of the North Eastern Railway, although when the N.B. reached Kelso, the N.E.R. extended their line for about a mile beyond Sprouston to form an end-on connection. Sprouston station is right in the village, and being an outpost of the N.E.R., it possesses a single road engine shed, an elaborately decorated steel water tank which bears the inscription "North Eastern Railway, Northern Division, 1864," and several sidings. The North Eastern used to run through trains of their own from Kelso to Tweedmouth but they kept their locomotives overnight on their own property at Sprouston. For a long time the regular N.E. engine here was No. 273, one of Fletcher's "B.T.P." Class 0-4-4 tanks. Just when the shed at Sprouston ceased to be used regularly, I cannot find out, but it was probably shortly after the grouping, when the L.N.E.R. started to run all passenger trains on the branch as through trains between St. Boswells and Tweedmouth or Berwick. However, it was brought back into use again during the last war to house a refugee from the Railway Museum at York —the Great Western's *City of Truro*.

Leaving Sprouston the line comes nearer to the river on a falling gradient for about a mile. On a short level stretch the train passes from N.E. to N.B. metals and is then faced with a mile of 1 in 72 up to Kelso station, which is 22¼ miles from Tweedmouth, and with six stops, has taken the train 46 minutes to reach. Many years ago the N.E.R. had a small signal cabin at Mellendean, but when the block system of signalling was introduced on the N.B.R., this was dismantled. Except for the fact that the North Eastern division of the L.N.E.R. used a different type of ballast from the Scottish area, there is now no sign whatsoever of where the N.E.R. property ended and the N.B.R. began. But the railway enthusiast will soon observe that the mileposts have changed from the N.E. type, which are set at right-angles to the track, and numbered from Tweedmouth, to the N.B. pattern, set parallel to the line and numbered from Edinburgh (Waverley). We have seen the last, too, of the solid wooden slotted signalposts of the North Eastern and in their place are the slender lattice type of the old N.B.R.

Kelso, being one of the larger border towns, has by far the biggest and most important station on the line, situated on the high ground on the opposite side of the Tweed to the town proper. Both the up and down platforms, which are on a gradient of 1 in 72, have bays and there is a large goods yard adjacent to the up platform; although not on their own property, the North Eastern Railway had a small goods office here.

At the east end of Kelso goods yard is the old N.B. two-road locomotive shed and the remains of the turntable pit. Until very recently this shed was in regular use, for the Sentinel shunter allocated to Hawick shed until mid-1955 lived here. There was always a lot of work in Kelso goods yard, and as the sidings are rather short and cramped, the N.B.R. used to use several horses here to shunt it. These were termed "hairy pilots"! It was heavy going for them, and in 1922 the N.B.R. bought a petrol shunter of 40 h.p., built by the Motor Rail and Tram Car Co. Ltd., to replace them. It is said locally that this used to be grossly overloaded, although the N.B. Rules stipulated that its maximum load was five wagons. It was transferred to the Southern area of the L.N.E.R. about 1930, where it was subsequently damaged by fire and rebuilt beyond all recognition. In its place one of the new 100 h.p. Sentinel shunters of Class "Y1" was sent up and this had the unique distinction of being numbered in the "9000s" amongst the N.B. engines, as it was working in Scotland. Originally numbered 9529, it became 8138 under the new L.N.E.R. scheme. It used to go to Hawick, its parent shed for boiler wash-outs and repair, but spent all its working life at Kelso.

For some extraordinary reason, all trains spend anything from six minutes upwards at Kelso. The first train to Berwick in the mornings, which has to arrive early because it brings the mails and papers, spends no less than 54 minutes in the station.

From Kelso to St. Boswells, 11½ miles away to the west, the road is much harder, with longer and steeper gradients, and some fairly sharp curves. The start from Kelso

itself is a severe test for the down trains, for not only is the driver faced with the difficulties of starting on a gradient of 1 in 72, he also has to cross over on to single track just beyond the station, as the other line was lifted over twenty years ago, and the line to Kelso Junction box, where we join the Waverley Route, remains single all the way. The line leaves the Tweed at Kelso and goes up the valley of the Teviot for a few miles ; this stretch is in favour of west-bound trains, as they get the benefit of a falling gradient of 1 in 150 for two miles along the steep-sided valley. At the bottom of this gradient the line swings northwards and crosses the river on a high, magnificently curved, stone-arched viaduct. Since the other line was lifted the track has been re-aligned a little to ease the approach to this bridge, but immediately after it is crossed, the train jolts over some facing points, with a 15 m.p.h. speed restriction, on to the double track through Roxburgh.

Roxburgh station (3 miles from Kelso) is well equipped with station buildings and sidings, and it is here that the single line branch from Jedburgh comes swinging in from the south-west through a platform of its own on the west side of the station, to trail into the St. Boswells line just beyond. The powers obtained by the N.B.R. in 1846 for the Kelso branch also authorised them to build a line from Roxburgh to Jedburgh, but these powers were allowed to lapse, even though the Kelso branch was built. In May, 1855, the Jedburgh Railway Company obtained an Act of Parliament to build the line and it was opened on July 17, 1856. Worked from the beginning by the N.B.R., it was absorbed by them in 1860 and closed to passenger traffic on August 12, 1948.

Roxburgh station is the only passing place on the line between Kelso and the Waverley Route. Having changed tablets with the signalman, our driver opened up the regulator and his engine started to tackle the 2½ miles gradient of 1 in 150 over the high ground between the Teviot and Tweed valleys to Rutherford. Since the main buildings at this small station are on the down platform, the line has again been re-aligned and here it is the up line that has been lifted. Leaving Rutherford the track swings westward again, having entered the Tweed valley, and, with gradients in their favour, the driver and his engine made short work of the 2½ miles to Maxton, where tablets were again exchanged. The remaining 2½ miles to Kelso Junction provided easy running, for the line is either level or slightly downhill, except for the last little bit, where there is a very short climb of 1 in 100 to join the Waverley Route. After slowing down to drop the tablet and pass over the junction on to the main line, the driver opened up for a last half-mile sprint into St. Boswells station, which lies under the shadow of the triple peaks of the Eildon Hills. The 11½ miles from Kelso had taken 25 minutes.

In pre-grouping days all trains used to terminate at Kelso and it was not until the mid-1920s that the L.N.E.R. started working them right through. Before the Berwickshire line from Reston Junction through Duns to St. Boswells was closed in August, 1948, several trains made a circular trip between Berwick and St. Boswells, going out by means of one branch and returning by the other. But since then the passenger train service on the Tweedside line has consisted of four trains daily in each direction, which allowed the two engines on this work, one from Tweedmouth and one from St. Boswells, which is a sub-shed to Hawick, to do a trip out and back again in the morning and another in the late afternoon. The engine working from the St. Boswells end also found time to do a midday trip to Kelso and back, while there was a midday train from Berwick to Coldstream and back on Saturdays only as well until about two years ago. When the writer was living in the Kelso area in 1951-2, the regular engines were a Hawick "C15" 4-4-2 tank and an ex-N.E. "G5" 0-4-4 tank working from Tweedmouth shed. However, the Hawick "C15s" are now all scrapped, and trains seem to be worked by whatever type of locomotive the shed can provide. Similarly, Tweedmouth has now lost its "G5s" and has been using L.N.E.R. class "J39" 0-6-0s fairly regularly.

In recent years passenger traffic has been light on the branch, and observation on the journey over the line certainly confirmed this, many of the stations having no passengers at all. The busiest trains used to be those that conveyed school children between St. Boswells and Kelso, but even they now go by bus. In the present timetable there are only two trains daily in each direction, plus a midday train to Kelso and back, all worked from St. Boswells. Goods traffic is still worked by the North Eastern Region up as far as Kelso, while the Scottish Region work down this far, as in pre-grouping days.

B.R. STATE THEIR CASE

(*Concluded from page* 594)

of £50 millions over and above interest on capital and loans (but not any on accumulated deficits, which, at 5 per cent, could rise to as much as £20 million p.a. by 1962, after which the figure would decrease). As the review remarks, since none of the modernisation projects tackled since 1954 have failed to come up to the financial prospects envisaged when the plan was published, there is no reason to be chary of accepting these estimates.

FESTIVAL OF STEAM

Once a year, Edinburgh puts on its great Festival of the Arts. All the year round the Scottish capital is the busy meeting-place of East and West Coast steam, from Pacifics to graceful pre-1923 types.

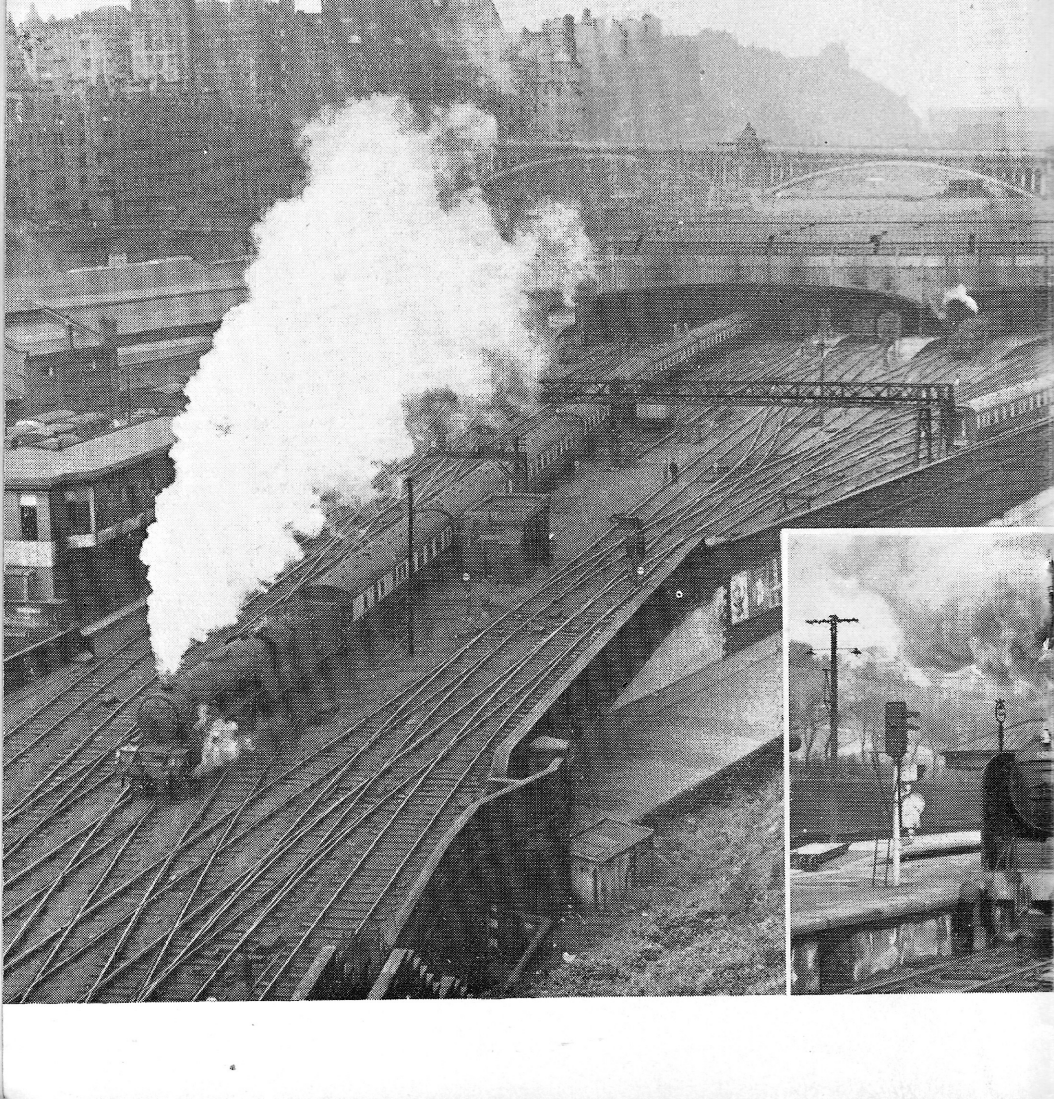
Above : It's coming up to 9.30 a.m. on a summer's morning and the "Elizabethan" is on its mark at Waverley station. Class "A4" 4-6-2 No. 60011 *Empire of India* is the engine. *[Eric Treacy*

Below : The spacious concourse at the end of Waverley station's northern bay platforms, looking across to through platforms Nos. 10 and 11. *[Eric Treacy*

FESTIVAL

Right : The southbound "Heart of Midlothian" prepares for its 2 p.m. departure from Waverley's Platform No. 1, after Class "A2" Pacific No. 60535 *Hornets Beauty* has brought into the northern half of the platform the connecting train with through coaches from Aberdeen. [*G. F. Heiron*

Below : Class "A3" 4-6-2 No. 60043 *Brown Jack* pulls out of Waverley station for Carlisle with the 10.5 a.m. to Leeds and London (St. Pancras). [*G. F. Heiron*



OF STEAM

(continued)

Below : The main picture catches a stirring duel of Pacifics as the two 4 p.m. expresses storm out of Waverley on July 28, 1954. Heading the Perth train on the left is Class "A1" No. 60159 *Bonnie Dundee*, while Class "A3" No. 60094 *Colorado* has the lead on the Glasgow train. The inset photo shows Class "A2/1" 4-6-2 No. 60509 *Waverley* on a local in one of the north end bays of its namesake ; in the background is the North British Hotel. [*G. F. Heiron*

Above : Stately departure from Waverley's south end of the up "Queen of Scots," headed by Class "A2" 4-6-2 No. 60529 *Pearl Diver*.
[Eric Treacy

Left : Evening rush hour at Waverley — Class "V1" 2-6-2T No. 67616 sets out with a local, while on the right a station pilot, Class "J83" No. 68478, fusses about its business.
[Eric Treacy

FESTIVAL OF STEAM

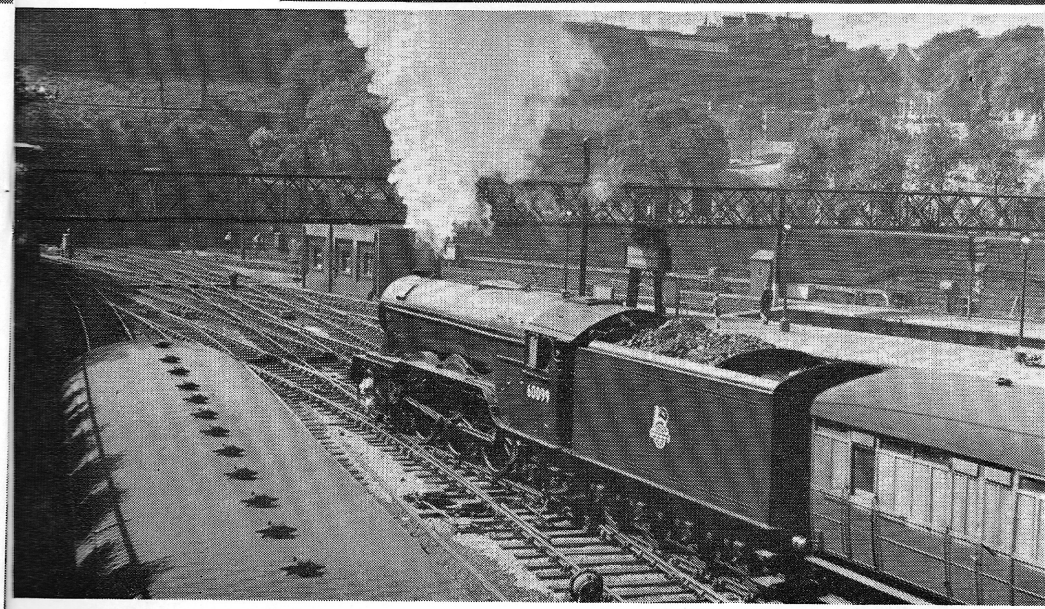
(continued)

Right: From Princes Street Gardens you command a superb view of operations at the north end of Waverley. And when 4 p.m. comes round the simultaneous departure of two Pacifics is worth watching. Here again the Glasgow train behind "A4" No. 60009 *Union of South Africa*, has a head start on the Perth, headed by "A3" No. 60097 *Humorist* on July 28, 1955.

[G. F. Heiron

Below: A quarter of an hour later there is a departure for Aberdeen, with which Class "A3" 4-6-2 No. 60099 *Call Boy* makes for the Mound Tunnel. To the right the gardens climb up to the famous Princes Street itself.

[G. F. Heiron



FESTIVAL OF STEAM

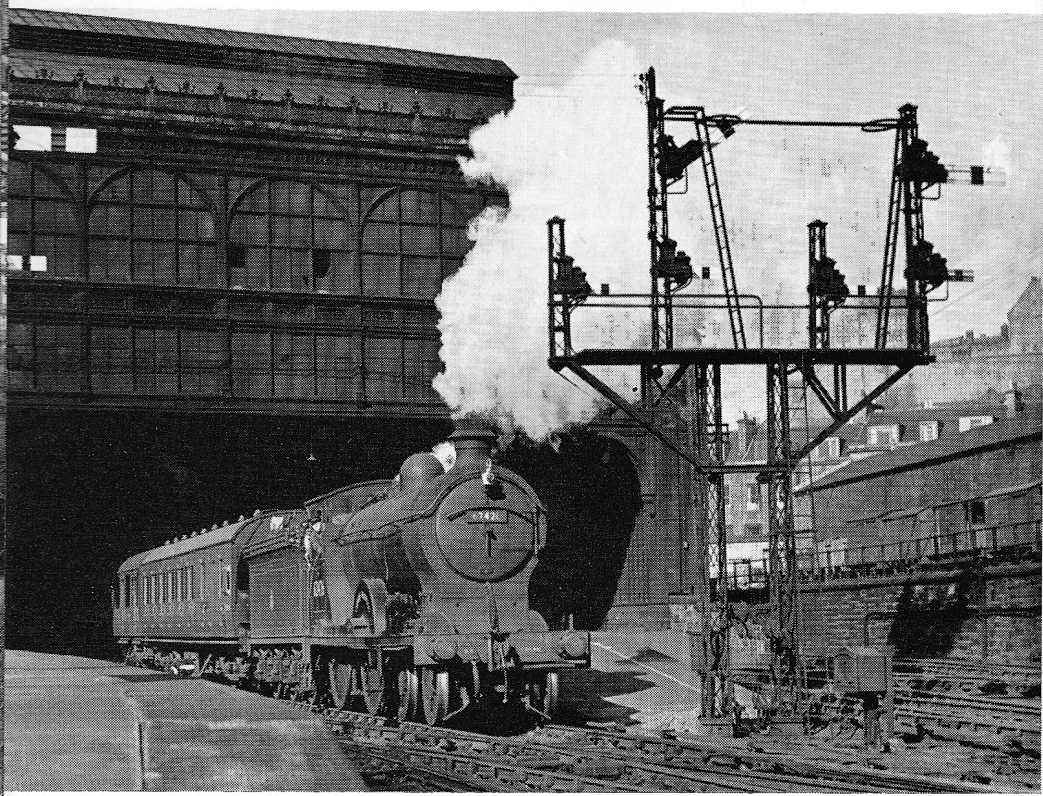
(concluded)

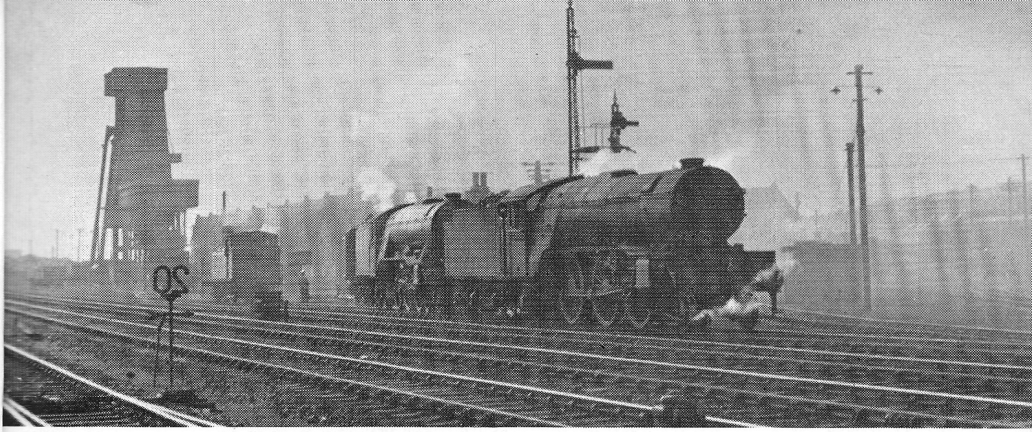
This page : Princes Street station, down the road from Waverley, is not so busy, but it has its moments when a Pacific appears on a fill-in turn. On the left "Britannia" No. 70054 *Dornoch Firth* sets out with a stopping train to Carstairs; in the picture below, with the city's castle ramparts visible on the extreme right, Class "D30" 4-4-0 No. 62426 *Cuddie Headrigg* departs on the 5.22 p.m. to Stirling.

[Eric Treacy, W. J. V. Anderson

Facing page : All quiet for a moment (*top*) at Haymarket shed ; (*centre*) at the south end of Waverley as "J83" 0-6-0Ts Nos. 68474 and 68477 take a breather; and (*bottom*) at St. Margarets shed.

[Eric Treacy





68474
68477

Talking of the "Ponies" . . .

A Footplate Commentary by
"TORAM BEG"

WE got the 4-4-0s from the Great Northern section of the L.N.E.R., who classified them "D1." What their G.N. classification was I haven't a clue. We nicknamed them "ponies," and I've had more "cold" runs on them to the mile of track, than on all the rest of the engines I've handled. They were really fantastic, were these "ponies" when they came north. They were in rags, but in spite of all the cursing they received, there was something in the "couldn't-care-less" effect they had on anyone with a sense of humour, and you couldn't help developing a certain affection for them.

Generally they were tied behind a *real* engine when the load was supposed to be heavier than the latter could take. There the "pony" would pose, its driving wheels looking more slender, its out-thrust smoke-box "cocking a snook," its Westinghouse pump spluttering, and a general air of sheer impudence warning all who understood its language : "Just wait till I get you on the road !" And when it did get you on the road, what it could do has yet to be fully enumerated. Those who took the "ponies" seriously adopted a hopeless attitude, but as I treated them as they treated me, I managed more or less to "bring 'em back alive."

It is, however, true to say that there was hardly a siding into which they hadn't been kicked off, as more of a hindrance than a help on the various roads where their efforts at assisting to run express trains proved futile. Very seldom were they allowed on a train on their own. Now and again, the operating folk tried to get me to run a goods train with them after the Westinghouse brake was removed and substituted by the vacuum. After one such experience, I flatly refused with all the reasons plainly stated, and the authorities were sensible enough to back me up and banned them for goods working. At the time the 4-4-0s came amongst us, we were gasping for power—but not all that much gasping !

So they tied an occasional "pony" behind an East Coast express engine and pretended it would help them out. Quite a few times I was sitting in the cab during those hectic moments. Sorry—I shouldn't have said "sitting" : there was no place to sit ; in fact, there was very little cab. Where the driver normally sits was taken up by the reversing quadrant, and he had to watch the handle of that reverser like a hawk, for once the performance commenced the screw which held the reverser when notched up had a playful habit of slacking back, and that handle could turn with the speed and force of an aeroplane propeller. It was just too bad if your leg, or hand, or arm was in the way.

So once the driving wheels started moving, the tip was to stand something like a "swaddie" at a military funeral, at attention with reversed arms. Both arms, hands and shoulder muscles would be at the strain, holding on for all you were worth to the pull-out regulator handle, which more often than not was minus the thumb-screw that was supposed to hold the throttle open against the enormous pull of a spring doing its best to shut the thing.

There you were, standing to attention, more backwards than erect, with that "pony" grinning diabolically at you, saying as plain as anything : "Let's have fun and games." Just to introduce the personal element, it would almost shake your teeth out in a phenomenal slip where no sensible locomotive would have so disgraced itself.

That also was the signal for you to nod at the exhaust injector and before you opened the throttle again, your mate (if he was lucky) had it working. Once it was on it was kept on as long as possible. You didn't get a second chance with that injector ; it would deign to go on at once, but had to be torn down and the bits petted and pampered almost every time it was used. Seldom, if ever, did you arrive at the end of a trip with both injectors working. But what could you do ? There were no spare parts. "Do your best, boys," was all they could say in encouragement. Nevertheless, it was fun, even if both my mate and I were black and blue all over after every trip we made on the "ponies."

These were a few of the moves in the game. Every time I made one ready for the road, quite apart from the normal preparation of the engine, I made a special point of seeing that the water regulator for the exhaust injector was actually doing its job (I think this injector was an "F" type, which gives an idea of its senility). The water regulator was not unlike the turnkeys you see being used in the streets, a long stem from the cab with a box spanner at the end to fit a key in the injector body ; more often than not the key was round instead of square, and you can imagine what

happened when the handle was turned. It just went round and round, with nary an effect so far as water was concerned, so I had to see to that before I left the shed.

Then I filled two eight-pint cans with *cold* water and carefully stowed them (along with a "pourie" also filled with *aqua pura*) in the tool box. I then almost swept the ashpan clean and filled up the gaps between the smokebox door and the smokebox with flax and red lead, for there was no such nonsense on our "ponies" as air-tight smokebox doors; how could there be when you never finished a trip without the smokebox becoming red-hot? You'll have guessed by this time they didn't steam—and that's putting it mildly.

So, with an audacity unbelievable, let's tie ourselves on behind Jock Binnie and his Gresley Pacific *Merry Hampton*, and with the cockiness of our comparative youth (our "pony" is young in heart if nothing else) ignore Jock's scowl. Actually, he's not scowling at all, but he's dark, serious and Spanish-looking, and in those war years did more than his fair share in taking them along the road.

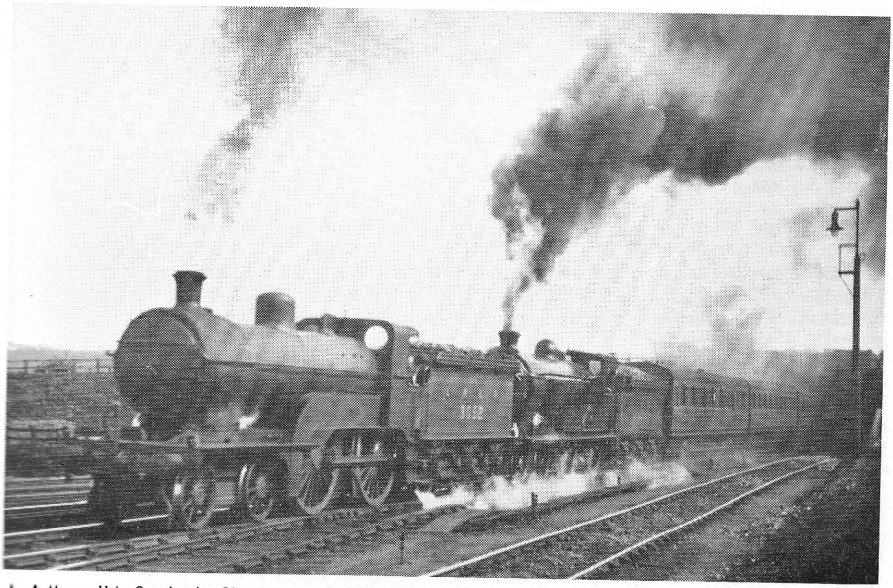
Knowing him, I talk turkey. "Look, Jock, she lay down last time she was on the job. I'm not having her do that with me. She'll be with you on the sticky bits—do your stuff when we need a breather." That's all the conversation necessary before we leave with the 700 tons of the "Night Scotsman" on that pitch-black, war-year's night I have in mind.

Seven hundred tons of train, packed corridor-tight: one engine and a bit to do it; poorish coal, freezing weather: and Newcastle 125 miles away. I nod at the exhaust injector as No. 3051 starts to dance on the frosty rail, and just to retaliate I grin back as diabolically as she does to me. "Maybe you have a trick or two, but so have I," I mutter.

I'm not at all surprised when the pressure starts to drop before we've gone five miles, but I'm not taking any notice when my mate Jimmy asks: "Will I shut it off?" He means the injector. "No, keep it on, and watch my methods," I reply. And the needle keeps falling and falling.

Jimmy is doing everything in the book to make steam, but the injector and my "canny" throttle opening, to say nothing of an infinitesimal cut-off, is taking more out of the boiler than he can generate inside. I'm biding my time, though, for I simply must give Jock a wee boost up the climb that precedes Drem.

The roars from *Merry Hampton* ahead drown even the ring from the "pony's" coupling rods and driving wheels, but even if she is bouncing like a pea on a drum, 3051 isn't being run off her feet. Her tender is slack coupled, and is making Jimmy's right leg do a "rock-'n-roll" that would make the present exponents look as if they were standing still. But he's only concerned with that steam gauge—150, 130, 120, 110, 100 lb.—as we start the longish, fast run-in to Dunbar with a twelve-mile bank ahead.



★ A "pony" in Scotland—Class "D1" 4-4-0 No. 3052 pilots Class "D30" 4-4-0 No. 9497 *Peter Poundtext* out of Inverkeithing on an Edinburgh-Perth express. [*P. Ransome-Wallis*

The "pony" is cold all right, and we are only twenty-five miles out on our trip of 125 miles.

It appears hopeless to Jim. "Are you coming off ?" he asks. "No," I assure him, and I give a toot on the whistle to Jock, shut the throttle and nod at the injector for Jim to shut it off. For three miles the blower is full on and the steam is rising. Back goes the needle—120, 130, 150—and it is trembling on the 180 mark as I yank the throttle open and let Jock ahead know that we are still with him. No. 3051 is doing a bit of roaring herself now, but there's a long way to go and I'm discreet where it's possible.

That twelve miles of bank is the worst hurdle in the whole 125 miles, and really the blue-print for the whole trip ; it all depends on how long 3051 can go on one boiler-full of water. Jock needs all the pressure we can give him on the last seven miles, so for a fraction of a second I slam the throttle shut and on an easy bit of the hill, providence is kind—the exhaust injector *does* go on for the briefest of spells and that's all we can afford before it again has to be shut off to give us steam.

The fire is fairly belching from the chimney on those final seven miles, but the water is coming down steadily in the gauge glass. Down it comes to half-glass, then to quarter-glass, before I pull the trick which settles the problem of whether we reach Newcastle or not.

You must here understand that the main cause of the "ponies' " failures were from the unreliability of their injectors. A "cold" engine can be wangled along the road not so badly if you are sure that the water will go into the boiler just when you want it. This was not so on the "ponies." The exhaust injector was so worn that, as I've already said, you were lucky if it worked twice on the road, the "lifting" live steam injector was in the same boat unless you took certain steps, and right now I'm busy taking them.

The cans and the "pourie" filled with cold water are produced. I go through the motions of trying to get the "live" injector to work. I needn't have wasted time—a touch on the water pipe tells me that ; it is hot, and this is what causes its continual failure. The heat has to be killed before we can get water into the boiler, and the sixteen pints of cold water in the cans are for that purpose. Never mind the technicalities—suffice it to say that the pipe is filled, becomes almost ice-like to the touch and when the steam key is twirled—blessed relief—the whine from that injector tells us it is lifting. Now there are long miles of drift ahead with Jock taking us along at seventy, before we are again needed to jockey him up the next rise.

That was how the "ponies" treated us in Scotland. That they got little in the way of maintenance was the fault, not of the will to do, but of the lack of the means to do it. Most of us, recognising this, never blamed the engines. When they finally expired I do not know. I came across them later stacked away in odd corners waiting for the scrap heap to claim them, and seeing them thus I had it in me to believe that in their hey-day they may have been some engine-man's pride. Up to now I've never come across anyone who had this experience ; if by any chance anyone who had them in their prime is reading this, along with many more enginemen, I would be more than interested in hearing a pleasanter account than the one I now complete.

HIGH SPEED ON THE W.R.

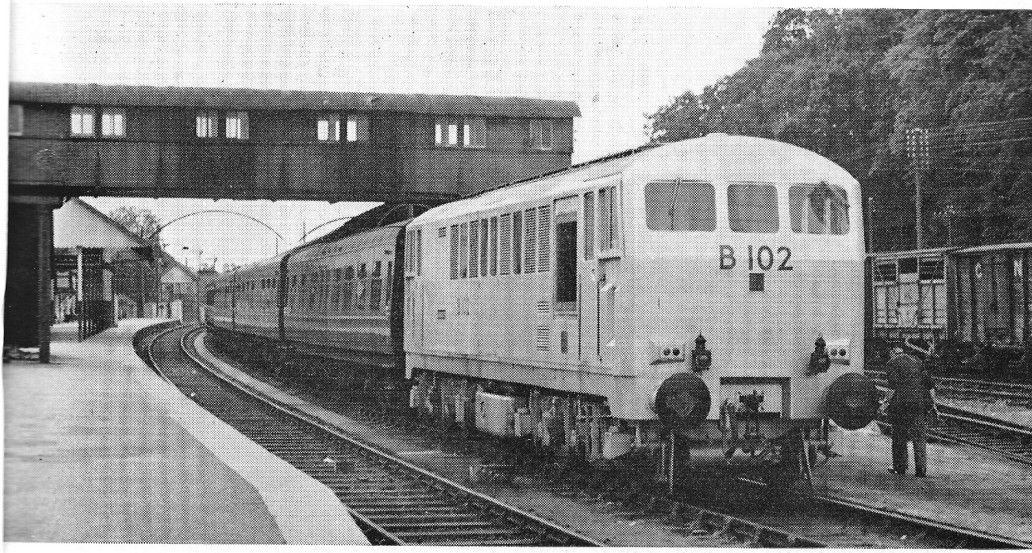
(*Concluded from page* 601)

slight descent (1 in 754-880) to Didcot it seemed impossible to get any stopwatch reading other than 12.6 or 12.8 sec. (71½-70½ m.p.h.) to the ¼-mile ; on the flatter stretch from there I did clock a 13.0 sec. (69 m.p.h.) reading at Goring, after which we reverted to 12.6-12.8 sec. until the bad signal check at Reading.

After this delay, by Sonning the speed had accelerated very rapidly from 5 m.p.h. at Reading West Junction to 69 m.p.h., and from Maidenhead on to Old Oak Common once again we had the succession of 12.6 and 12.8 sec. readings. The train had been allowed an extremely liberal 80 min. for the run of 77.3 miles ; actually we took 73 min. 28 sec., and without the check we should have completed the journey, by my calculation, in exactly 70 min. It is greatly to be hoped that the future diesel multiple-unit sets to be built by British Railways for express passenger service will not be so rigidly limited in the matter of maximum speed, as one of the major attractions of this type of traction, so widely exploited on the Continent, is its speed potentiality. Surely our future diesels are going to be allowed to travel as fast as our steam locomotives !

COLLISION AT LONGMOOR

Six persons were killed in a collision in thick mist on the Longmoor Military Railway on October 25, when two trains met on the single line north of Liss Forest station, at which, according to reports, they were supposed to have passed each other. Stanier 2-8-0 No. 512 was at the head of a passenger coach and wooden guard's brake bound for Longmoor and diesel No. 877 *Bahri* in charge of a special maintenance train of two brake vans and two bogie flat wagons bound from Longmoor to Liss.



★ New C.I.E. "B" type A1A-A1A diesel-electric locomotive No. 102 pauses at Mallow with the Sunday 12 noon from Cork to Dublin (Kingsbridge) on August 5, 1956. Note the recess in front of the cab door to accommodate the tablet exchange apparatus. [*C. P. Boocock*

DIMENSIONS

Length over frame	45 ft. 0 in.
Bogie centres	24 ft. 10 in.
Bogie wheelbase	10 ft. 6 in.
Height from rail	12 ft. 10⅜ in.
Wheel diameter	37½ in.
Weight in w.o.	75 tons
Maximum axle load	14¾ tons

POWER

Diesel engine output 960 h.p.

SPEED

Maximum service 75 m.p.h.

TRACTIVE EFFORT

Maximum ...	41,800 lb.
Continuously rated	16,900 lb.

New 960 h.p. diesels for C.I.E.

THE two Sulzer diesel-electric locomotives of 915 b.h.p. which have been at work on the Coras Iompair Eireann system since 1950-51 are being supplemented by 12 960 h.p. locomotives constructed by the Birmingham Railway Carriage & Wagon Co. Ltd., and embodying Sulzer power plants which C.I.E. has had on hand for some time as part of a programme drawn up in 1948 but subsequently altered. When the power equipments were almost ready, C.I.E. abandoned its first proposal for six 1,800 b.h.p. express diesel-electric locomotives for fast services on the Dublin-Cork main line and concentrated instead on general-purpose units which could work over all main lines. Like the original Sulzer locomotives, the output of which is being raised to 960 h.p. in conformity, the new units are of the A1A-A1A type, whereas the 94 1,200 h.p. locomotives being supplied by Metropolitan-Vickers Electrical Co. Ltd., and described in the October, 1955, issue, are of the Co-Co type.

A six-wheel modified Pennsylvania-type swing-bolster bogie, resembling that fitted to the Sulzer-Birmingham locomotives of the Commonwealth Railways, Australia, has been incorporated ; each bogie frame is an integral welded steel structure but has separate axlebox guide plates. The welded bolster is not sprung separately ; the swing links are on knife edges and side swing is stabilised by hydraulic stabilisers. The suspension embodies nests of helical springs between each compensating beam and the bogie frame, and hydraulic shock absorbers. Timken roller-bearing axleboxes and one-piece disc wheels are fitted. Duplicate controls in each cab allow for left- or right-hand driving. Recesses in the cab side walls house the staff-changing apparatus. There is ample space for the crew to move round the engine-generator group.

The engine is of the Sulzer 6LDA 28 type, with six 11 in. by 14.2 in. cylinders. It and the Metrovick main generator and auxiliary generator are carried on a common welded steel subframe which forms part of the engine crankcase structure. There are four Metrovick force-ventilated nose-suspended traction motors.

The new locomotives are numbered B101 to B112. It is reported that the 550 h.p. Metrovick diesels on order will be known as Class "C."

C.I.E. experience with its diesel railcars

IT is now more than three years since Coras Iompair Eireann introduced its first 5 ft. 3 in. gauge diesel railcars, and in the ensuing years a fleet of 66 A.E.C.-engined cars has been built up. How C.I.E. has fared with its stock of railcars was the subject of an interesting paper read recently to the Institution of Locomotive Engineers by the Assistant C.M.E. (Maintenance) at its Inchicore works, Mr. M. J. Devereux.

As most readers are aware, the railcars have been coupled with C.I.E.-built trailers of a pattern similar to standard C.I.E. corridor stock. Four-car sets comprising two railcars with two trailers coupled between them were made up, and on units operating main line or long-distance branch services one trailer is a buffet car. All seats in each unit are equipped with fixed or folding tables, so that meals can be served throughout the train, and it is apparent that passengers prefer to take their food at their seats ; that apart, the C.I.E. arrangement has the operating advantage that the seating in the buffet car itself can be included in the payload accommodation of the four-car unit, which thus totals 36 first and 167 second class seats, including the 39 in the buffet car.

Latterly some of the trailers have been equipped with driving controls at one end to permit the formation of two-coach units consisting of a power car and driving trailer. An odd discovery was that these two-car units were unable to maintain the normal railcar sectional timings of the four-car units. At first it was thought that was due to the lack of streamlining of the outer end of the trailer, and although this belief was supported by a difference in performance when the rounded end of the power car was at the head-end, running was still below the standard of a four-car unit. It would appear that the basis of the trouble is that, with a two-car unit, the front-end wind resistance is not proportional to the size of the train.

Maintenance of diesel railcars has created more problems than the servicing of diesel locomotives, and Mr. Devereux admitted that the C.I.E. has not yet found the complete solution. For one thing, when you are running eight-car trains of two units, as C.I.E. does, you must build a shed 500 ft. long if you are to avoid breaking up the set by shunting every time it requires attention, so as to concentrate the power cars together. Again, you can fuel a diesel locomotive under cover, but not a railcar set, particularly one with a buffet car, unless you want a stench of oil to permeate the cars ; C.I.E. therefore fuels all its railcars in the shed yards. C.I.E. has found that it pays to concentrate railcar maintenance in as few depots as possible, and to lay them out so that every item of servicing, from cleaning to mechanical work, can be carried out in one rota of operations between trips, with the minimum of movement of the stock, and without having to break up units from their required operating length. On the staff side, the better policy has proved to be the training of a limited number of selected staff to a thorough and detailed knowledge of the equipment, rather than to spend time on grounding a large number of maintenance men in basic knowledge. As a result of their railcar experience, C.I.E. took the precaution of training thoroughly a special maintenance staff as soon as they had ordered their rapidly growing fleet of diesel locomotives.

C.I.E. found that most steam locomotive drivers could successfully operate a diesel railcar after 10 days' training. At first there were cases of drivers getting into difficulty through unconscious association of railcar controls with those of a steam locomotive—for example, in tending to regard a gear change as the equivalent of "notching up" and thus not changing down on up gradients if they had time in hand. Later it became apparent that men who were given a comprehensive instruction in the working of the diesel engine, gearbox, transmission and other equipment, were more competent than those who had been trained without having the operation of the various components fully explained to them. Trainee groups of not more than eight men were therefore allocated to an instructor (larger groups discouraged the men from asking questions) for both theoretical teaching and practical demonstration on the track. Incidentally, the drivers are not required to examine their units daily as they did their steam locomotives ; that chore is looked after by the depot maintenance staffs.

The normal C.I.E. four-car diesel unit weighs 140 tons, and the power cars' four engines put out 500 h.p. to move it and to operate the auxiliary equipment. The available h.p. per ton of train is therefore very low, particularly for a mechanical transmission where the full h.p. of the

engine is only available at full engine speed in each gear. Since the usual three-hour schedule for the run of 165 miles from Dublin to Cork requires a start-to-stop average of 55 m.p.h., the diesel engines are worked pretty hard, and at full throttle for most of the journey. Nevertheless it is now possible to fix cylinder-head examination at as much as 60,000-mile intervals. At this stage engines and gearboxes are completely replaced, as C.I.E. can release the cars to traffic again more quickly by this method than by carrying out necessary repairs with the equipment mounted. Every 120,000 miles the cars go to shops for general overhaul ; tyre life between re-turning was a principal figure in determining this limit, but it also coincided conveniently with the life between repairs of other components—and, of course, the 60,000 mile limit for engine life between complete examinations.

Of the whole equipment of the railcars, the diesel engines have proved the most reliable component, and any serious damage to them has resulted from failures of other equipment. For example, the most serious harm has occurred when the forward and reverse dogs on one axle fail to make over properly, while the others on the unit or units forming the train react fully to the driver's selection. When the train starts, the affected engine stalls ; then, as the other engines build up road speed, the reverse torque applied to the stalled engine through the hydraulic coupling starts to motor it in reverse, after which it starts to fire, drawing in air through the exhaust valves and exhausting through the air intake ; in addition, the lubricating oil pump is reversed, returning oil from the bearings to the sump and causing a crankshaft seizure. The most troublesome feature of the cars has been the transmission, but this, like some other items of the equipment, has since been modified.

Mr. Devereux also discussed the vexed question of heating diesel-powered equipment. The alternatives are : by electricity from a separate generator set ; by hot air from self-contained oil feed heating elements in each car ; by hot water heating from the

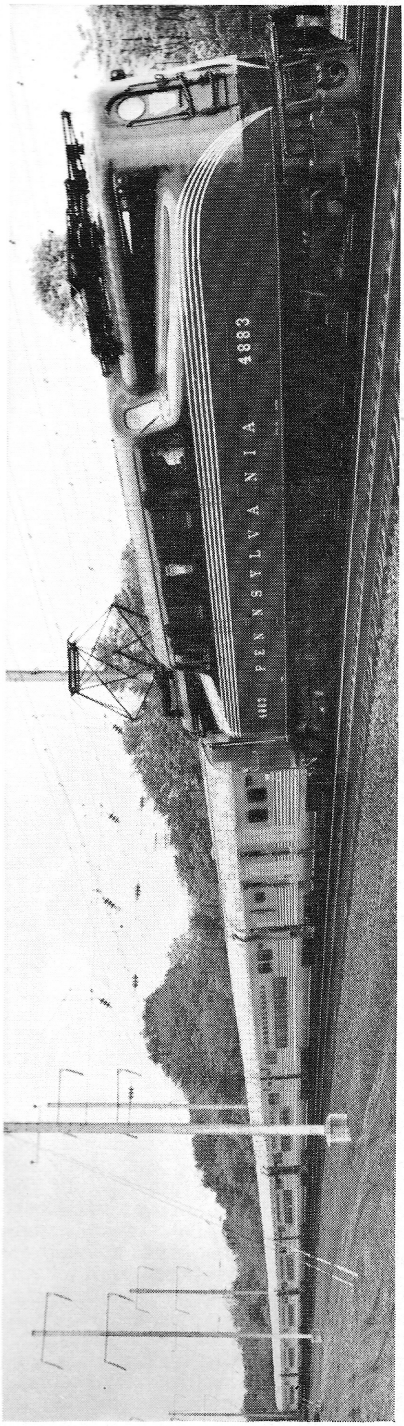
(*Concluded on page* 624)

The Budd tubular train

★ Interior of one of the new Pennsylvania R.R. Budd-built coaches, nicknamed "tubular" because of the method of construction. Note the raised section at the rear above the bogie. The lighting is fluorescent and the car is fully air-conditioned. [*Pennsylvania R.R.*

THE latest addition to the range of new lightweight passenger stock being designed to meet current American needs is operating on the Pennsylvania Railroad, which has taken delivery of a new eight-coach train of low-slung, stainless steel stock built by the Budd Company, and weighing only 382 tons. It went into service on June 24 last, between New York and Washington, bringing the number of stainless steel trains daily linking those cities to nine each way. The seven passenger coaches, 85 ft. long, weigh 40 per cent less than orthodox designs and their centre of gravity of 45.1 in. above rail level compares with the normal 54. They are only 11 ft. 9 in. high, or 1 ft. 9 in. less than standard stock. The heavy centre sill has gone ; the loads formerly borne by it are carried through the side sill structure around the depressed coach floor, which extends the entire distance between the bogies. The whole body structure has been designed as a modified girder with sides, roof, and floor welded together to form its integral parts.

Each coach is divided into three areas for 82 passengers. Reclining seats, with individual foot rests, are provided for 56 passengers in the lower section, the floor of which is only 2 ft. above the rails, and for 12 more at one of the higher ends above the bogies. Lounge chairs and settees accommodate 14 in the higher level smoking compartment at the opposite end. All electrical equipment is housed in a separate, matching vehicle, 53 ft. long, next to the locomotive. Here, electricity for heating, lighting, air-conditioning, and cooking is



★ The Pennsylvania R.R. "Keystone" express, formed entirely of new Budd tubular stock. The "power car" for lighting, air-conditioning and heating is coupled next to the Class "GG-1" electric locomotive. [*Pennsylvania R.R.*

generated. The 32 ft. engine room contains two 400 h.p. diesel generator sets, each rated at 265 kW. There is also an 18 ft. 6 in. food service galley in this car, with an all electric kitchen where light meals are prepared.

Each coach rides on two four-wheel roller-bearing bogies of a special, lighter design, incorporating smaller wheels than standard. All coaches are fitted with Budd disc brakes of type CF, in which the braking is performed by the pressure of asbestos compound shoes on air-cooled steel discs mounted on the wheel. Asbestos shoes consistently last more than 100,000 miles of service, compared with about 6,000 miles for the clasp brake shoe.

Facilities for the passenger include, in each coach, separate toilets for men and for women, electric drinking water coolers, luggage compartments, and overhead bag racks, and the fourth coach has a food service cupboard to augment the kitchen in the power car. Food is served to passengers in their seats. The interior finish is entirely of plastic in contrasting colours on ceiling, walls and ends, and the floors are rubber-tiled.

The Pennsylvania's "Congressional" train, when purchased in 1952, cost about $2,000 per seat ; today, the same cars would cost $2,300 per seat. The tubular train, with power car, cost about $2,000 per seat, but in mass production probably would cost about $1,500 per seat.

The train was developed by the Mechanical Research Committee set up by six United States railways, including the Pennsylvania, to plan passenger trains of new types adapted to modern transport needs. The tubular design and other developments are among the results of the committee's six-month study of all present and proposed designs for passenger stock in the United States and abroad.

Mr. James M. Symes, President of the Pennsylvania, introducing the "Keystone" (as the new train is named after the Pennsylvania R.R. emblem), termed it a $1,000,000 investment in the railway industry's research "for the ultimate train to meet tomorrow's potentials in passenger transportation." It was, he said, "the second introduction of lightweight equipment on the Pennsylvania this year. We are now conducting intensive tests of the General Motors 'Aerotrain'—an entirely different approach—in daily service between New York and Pittsburgh in order to weigh passenger preference for that type of equipment."

The "Keystone," hauled by a standard Pennsylvania "GG1" high-speed electric locomotive, is now making two round trips daily between New York and Washington, 224.8 miles, in regular service.

Last trip on the Welshpool & Llanfair

After a few days' postponement to keep it open for a railway enthusiasts' special trip, closure came to the narrow gauge Welshpool & Llanfair on November 5 last.

By W. A. TUPLIN,
D.Sc., M.I.Mech.E.

ON September 15, 1956, there was a certain amount of normal locomotive smoke to be seen near Welshpool station as one approached it from the town, but in front of the buildings drifted a smoke-cloud of the lighter shade that seems peculiar to small engines when they have been fired just before the first run of the day. So there was early confirmation of the rumour that a train was to be run to Llanfair Caereinion that afternoon.

Four drop-sided mineral wagons as "open seconds" (to use that description far more appropriately than in normal official practice) were found coupled between two brake vans, and the train was headed by outside-framed 0-6-0 tank engine No. 822. No formal statement of ownership was obvious on the locomotive and it was too clean to suggest immediately that it belonged to British Railways, but so it did. Its long chimney and the bunching of mountings on its short boiler called to mind the motive power on the lines described by the Reverend W. Awdry and his imitators, but it was clear that wherever the engine had started life, it had passed through some Great Western hands.

Station staff and trainmen were placing platform seats from the main station on the wagons and a platform truck was used as a stepping stone to ease the climb into the vehicles. The sides of the wagons were lifted into position and locked by cotters, the stationmaster collected from the passengers signed statements that they would not claim damages from British Railways even if harm should befall them, the officials exchanged signals that all seemed well, and off we went.

With hissing cylinder-cocks and very soft beats from the chimney, the engine took the train at a walking pace up over the canal bridge and to a stop just short of the main north-south highway through Welshpool. The fireman went ahead with a red flag to stop the traffic until the locomotive more effectively blocked the road, when he returned to the footplate.

Perhaps the best-known action photograph of the Welshpool-Llanfair line is that of a train passing between houses with fully occupied lines of washing and on this day the scene was reproduced as we went by some of the older properties in Welshpool. Further on, the newer houses have gardens stretching down to the line and there the surroundings were more colourful; but everywhere doors were open and householders stood waving to one of the few parties of the public to travel on the Llanfair line since 1931. A bright day would have made the trip idyllic, but at least it did not rain, nor were the passengers incommoded by even the heaviest emissions from the chimney as a light east wind carried them ahead of the engine when it was toiling up the 1 in 30.

For much of the distance from m.p. 1 to m.p. 3 (G.W. standard quarter-mile posts are used) the route is like a winding country lane with steep grassy banks and bushes close to the vehicles on both sides. The extra resistance of one sharp curve obviously slowed things down until the engine was given another notch and then confidently coped. Her beats were uniformly strong, clean-cut and equally spaced; "sweet and true at the front end" primly sums it up.

On a light 2 ft. 6 in. gauge railway used only for freight traffic for the last 25 years, the riding of the four-wheelers was extraordinarily good and one soon ceased to worry about that signed indemnity, at least on the up grades. And even down 1 in 30, surely an engine and two brake vans would hold back four wagons on dry rails? Certainly they did on this occasion and no one had any qualms.

The countryside in this district has beauty typical of the Welsh border, and the line brings one into intimate acquaintance with it. As a pleasure trip on a fine summer's day, a journey on the W. & L. must surely be unsurpassed in Great Britain, but one thought regretfully of the times when passenger trains ran over it and how much more thoroughly it must have been appreciated for utilitarian transport on stormy days of wind and rain. But Crosville buses do the work now and British Railways take their cut of the profit.

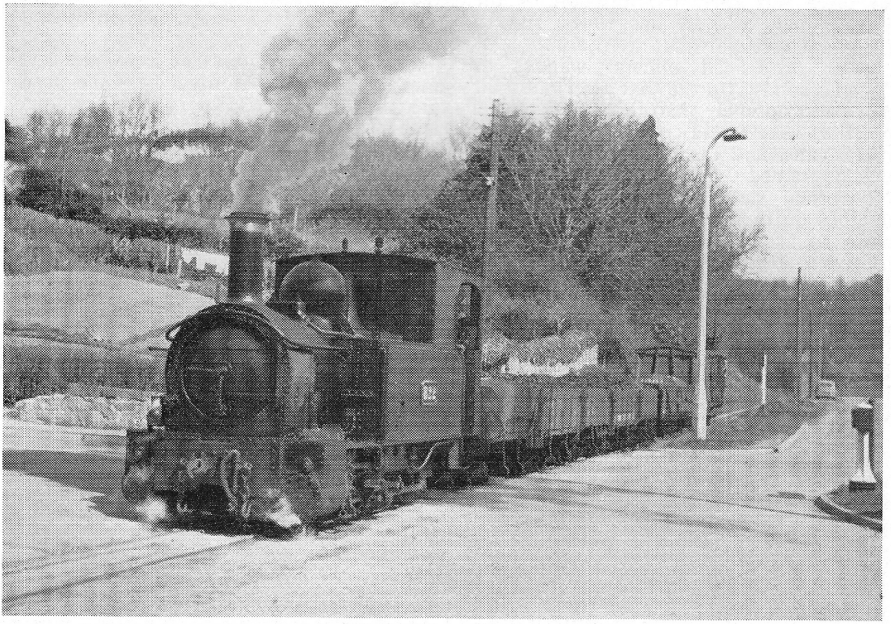
On September 15 the journey to Llanfair was completed in 55 minutes, which was the time allowed for regular passenger trains. There had been a stop to precede a cautious crossing of a public road with a "blind" intersection at the site of Castle Caereinion station, where a signal box still stands. On the other side of the track at this point was a steam road-traction engine with the mechanism above the boiler apparently well preserved, but with the chimney corroded

to a colander and ready to fall off.

The train and its passengers were thoroughly photographed at Llanfair. Here quantities of coal in the open and cattle food under cover showed the character of the freight traffic that has kept the line going for a quarter-century after the passenger trains were discontinued.

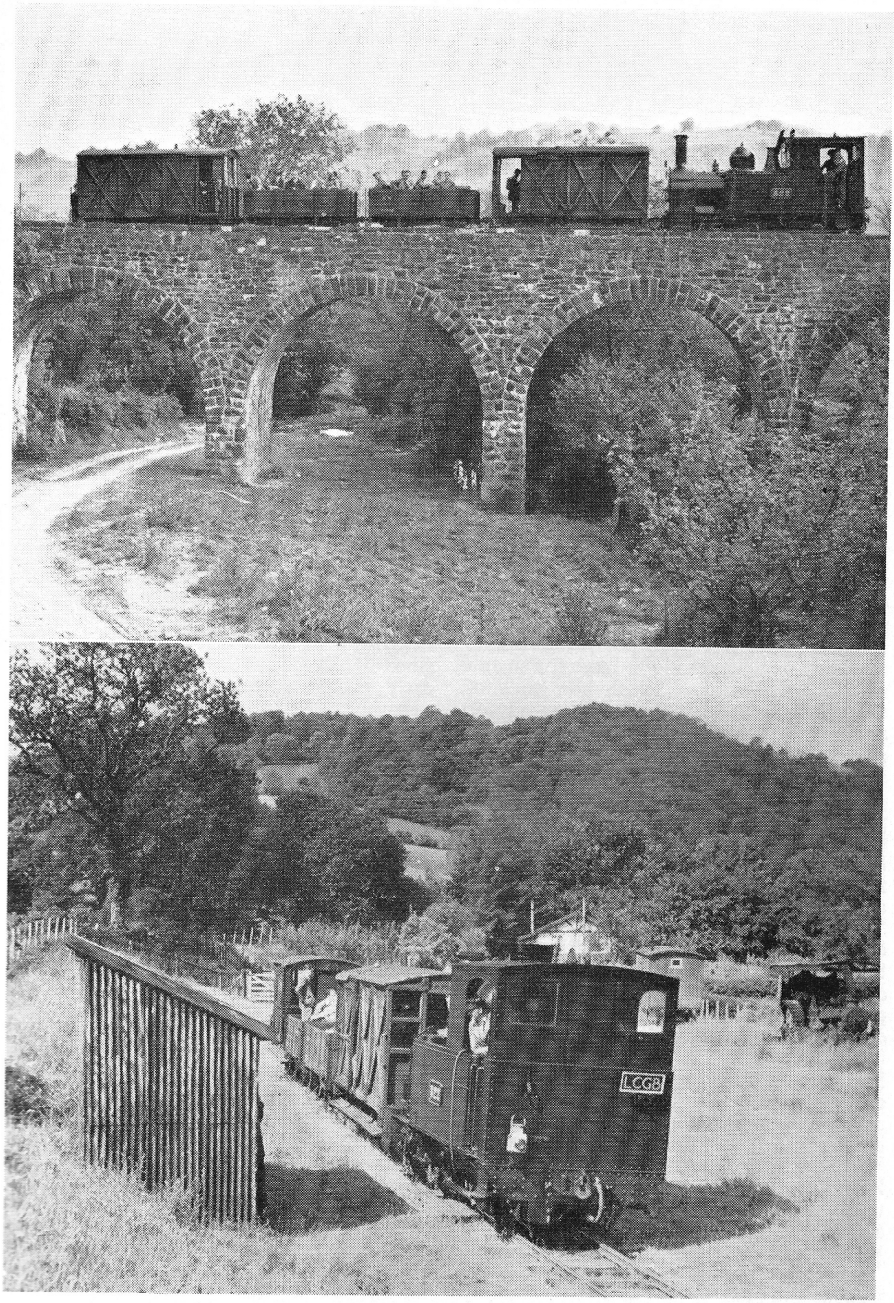
There was a chance here to learn more about the locomotive than can be found from previously published work. As in many small outside-framed engines, it is not easy to determine the wheel arrangement, for the wheels hide behind plates and axle-boxes in the sturdy "battleship" style that has fascinated many admirers of the old Great Western engines. One's first impression of No. 822 is that she is a 2-4-0 tank, but closer examination shows a coupling rod between each connecting rod and the frame, and she is in fact a 0-6-0 side-tank engine with outside cylinders and flat valves above them.

This engine (formerly *The Earl*) and the sister engine No. 823 (formerly *The Countess*) were built by Beyer, Peacock & Co. for the opening of the line in 1903 and are basically unaltered. Not even the replacement boiler on No. 822 has a Belpaire firebox, but in many other respects Swindon standards have been remorselessly applied. Thus the regulator in the dome is lubricated from on top in the old Dean manner. Top-feed is applied through fittings of an old standard Great Western pattern, but much smaller than those on most Great Western domed boilers at present. The safety-valves are in a standard Swindon trumpet almost as tall as the dome and behind it is an outsize counterpart of the "whistle-plate" to be found behind the whistles of most Great Western standard gauge locomotives. On No. 822, however, the whistles are above the cab roof and the plate must be for the purpose of persuading steam from the safety valve (rather than that from the whistles) to pass over the roof instead of obscuring the large front look-outs. But not once on September 15 was there a sound from No. 822's safety valves, and this showed the enginemen to have a confident know-how that seems rare on British footplates today.



★ The Welshpool & Llanfair goods crosses Raven Square, Welshpool, on April 4, 1956. At the head end is 0-6-0T No. 822. [*G. F. Bannister*

The engine is vacuum-braked, with a small ejector instead of a pump for maintaining the vacuum, but as there are now no vacuum-fitted vehicles in service on the Llanfair line, and as use of the ejector makes a noticeable difference to the consumption of water, only the hand-brake is now normally used on the engine. The large ejector and the brake-application valve appear to be of the standard type used on vacuum-fitted, steam-braked Swindon engines, but the steam-brake "setter" is omitted. Valves and pistons are oiled by a sight-feed lubricator of non-standard type, and pipes enter the smokebox on the right-hand side under cover of a rectangular



SOUVENIR OF THE WELSHPOOL & LLANFAIR

Above : No. 822 poses on the viaduct at Cyffronydd with two wagonloads of railway enthusiasts on June 23, 1956.

Below : The same special at Castle Caereinion. On the extreme right can be seen the decaying traction engine mentioned in the accompanying article. [*R. E. Vincent*

WELSHPOOL & LLANFAIR 0-6-0T
LEADING DIMENSIONS

Gauge	2 ft. 6 in.
Grate area	7.5 sq. ft.
Heating surfaces :	
Firebox	37 sq. ft.
Tubes	396 sq. ft.
Boiler barrel	3 ft. 5 in. diam., 7 ft. long
Boiler pressure	150 lb. per sq. in.
Cylinders	11½ in. x 16 in.
Driving wheel diam.	2 ft. 9 in.
Nominal tractive effort	8,200 lb.
Weight	19.9 tons
Maximum axle load	6.8 tons
Water capacity of tanks	350 gallons
Maximum height above rails	10 ft.
Overall length	20 ft.

casing reminiscent of those on Swindon 4-6-0s with large superheaters.

In accordance with Great Western practice, the driver stands on the right of the footplate, whence the regulator-handle and brake-handle are conveniently reached, but the reversing lever is on the left. This suggests that the engine originally had left-hand drive and has been incompletely converted. It would be interesting to know whether this unusual circumstance agrees with the drawing office records at Swindon or, on the other hand, is just another case where the shops used their discretion to do (or not to do) an awkward job in their own way and said nothing about it.

The firedoor is in the usual Swindon style and the 1¾ inch tubes look large for such a short boiler-barrel. The firebox ends of the tubes are easily seen, as there is no brick arch. If Swindon knows of this, it is to be presumed that No. 822 is well down the list of proposed conversions to double chimney and three-row superheater, as an arch is usually regarded as a prime essential. A standard injector is carried on the frame behind each cab-step and the coal-watering hose dangles out of the left side of the cab as jauntily as from a "King."

The Walschaerts valve gear is just as designed by Beyer, Peacock (although oil-holes here and there are plugged by Swindon corks) and incidentally looks much better proportioned than were some of the examples used on British main line engines before about 1912. A feature that might have been troublesome is that the bottom end of the combination lever is practically at rail level, but it normally strikes nothing more resistful than grass.

On the return journey from Llanfair, the locomotive took water from an overhead tank near the site of Dolrhydd Mill, again a stop was made at Castle Caereinion, and Welshpool was reached without incident.

The seats were soon removed from the wagons and most of the passengers stood by to see the train shunted back into the sidings. Just when the driver must have been opening the regulator, a juvenile passenger decided that the quickest way to get to the other side of the train was to climb over the combined centre buffer and coupling between two of the wagons, put the scheme into immediate operation and, getting clear as the train started to move, avoided a possibly fatal accident by a split-second. Few people witnessed this incident and no voice was raised in criticism, but it emphasised the belief that on occasions of this kind every child should be handcuffed to a sturdy adult.

C.I.E. RAILCARS

(*Concluded from page* 619)

railcar engine cooling system or from solid fuel water heaters on each car ; and steam heating from oil-fired boilers. The electric system has the advantage that there is no loss of heat in passage down the train, but on the other hand the fuel consumed by the diesel generator is greater than with an oil-fired boiler of the same output. Heating with the engine cooling water is not practical where trailers are involved.

About half of the C.I.E.'s railcar fleet was equipped originally with steam generators, resulting in the provision of one generator per train set, which supplied conventional steam heating equipment on the cars. The first winter in service soon proved these generators, with their output of 275 lb. of steam per hour, inadequate, since 100 lb. per hour was needed to warm each coach adequately. It was also apparent that heat loss increased perceptibly with road speed ; a train sufficiently heated at 30-40 m.p.h. became chilly at 60 m.p.h. and more, and a non-stop train colder than one making frequent halts. The equipment on the main line cars was therefore replaced by automatic oil-fired boilers of 500 lb. per hour capacity. This change has not fully solved the problem, for considerations not involved in extremely successful stationary plant of the same type crop up when it is mounted on wheels—for example, the need in design to consider space limitations as well as what is necessary to achieve efficient combustion ; the effect of passage through tunnels and great variations of wind pressure on firebox air pressure ; and the effect of vibration on the automatic devices. C.I.E. has been forced to the conclusion that the use of automatic oil-fired equipment on diesel trains requires the constant attention of a thoroughly trained maintenance staff.

Mr. Devereux admitted that the diesel stock on the C.I.E. had not been trouble-free, but most of the troubles has been eradicated in the course of time and the railcars are now giving satisfactory service. Many of them have now run over 250,000 miles and daily availability has been stepped up to 90 per cent. Fuel consumption is averaging out at about 2½ m.p.g. per four-car unit.

Locomotive Inspectors

By P. W. B. SEMMENS

FREQUENTLY, when studying articles about footplate journeys, one reads that "Locomotive Inspector X joined me on the footplate." From the lack of other references to these inspectors, the uninitiated might easily assume that accompanying the privileged footplate passenger was their only duty. This is very far from being the case.

Locomotive Inspectors are under the control of Regional and District Motive Power Superintendents. They have all in their time passed through the "ranks" of cleaner, fireman and driver, but only those drivers who have a sound knowledge of the design and operation of all types of engine are considered for promotion to the salaried grade of inspector. Some have engineering qualifications, obtained perhaps through study at night-school, and all have a thorough knowledge of the routes and locomotives in their particular area.

Perhaps the most important duty of locomotive inspectors is to examine cleaners and firemen for promotion to the ranks of "passed cleaner" and "passed fireman" respectively. Once a man becomes a passed cleaner, he may then take the place of a regular fireman should the need arise, and similarly, a passed fireman is permitted to drive an engine himself, accompanied, of course, by someone acting as fireman. These examinations, which are oral, cover the rules of block working, protecting the train with detonators in cases of emergency, and many other points from the rule book, besides details of construction and operation of the engine. In addition to conducting examinations of this kind, certain inspectors are responsible for instructing firemen in the art of raising steam, while others teach drivers the most economical methods of driving. All inspectors, however, are constantly on the look-out to correct any poor driving or firing they may come across, since they are responsible for the general standard of footplate work in their area. On other occasions, an inspector may make a series of journeys on some particular engine in order to find out exactly why the locomotive is the "black sheep" of the class, always losing time, however hard the fireman and driver try.

Knowing the traditional conservatism of enginemen in all but politics, the introduction of new motive power often causes inspectors some worry. Totally different driving techniques may be necessary with the new class of locomotive, and until all the drivers are accustomed to the change, lost time may be more frequent than they would wish. If the driver only learns by trial and error, it will take some time for him to find the best conditions, and in this respect the inspector, with his superior technical knowledge and experience, can speed up the process, especially since he will often visit the works to acquaint himself with those details of construction which are of importance.

On one occasion, I remember having a conversation with a driver and one of the local inspectors, during which I mentioned a footplate trip the inspector and I had had a short while previously on a 60-year-old class of locomotive, then in the process of being replaced by more modern motive power ; the latter was a design from a different pre-nationalisation company to that on which my companions had served. The driver was not at all struck with the newcomer, and said so. "It doesn't pull anything like as well on the first port of the regulator," he observed. The inspector replied by saying that the second port was there to be used, and that if it was, the results would be a lot better. I have no doubt that the next time the driver had one of the new engines, he tried the main valve of the regulator and found that the result was more satisfactory. The old class, some of which were unsuperheated, had short travel valves and a lever reverse, which meant that they had to be driven on the regulator, but the new engines would not react well to this method of driving.

On occasions there are large-scale investigations into the standard of locomotive running, when an inspector rides on the footplate of all the principal trains over a certain length of line. This requires a very complicated rota when a line such as the East Coast Route is under examination. On one such occasion, I spent some time on York station, and it was most interesting and informative to watch each inspector checking over the engine on his train, while it was in York. The mass of information that results from the inspectors' reports will enable the Motive Power Superintendents to find out any weak links in the organisation, so that they can be strengthened and the services improved. There is little need to remind readers how even comparatively small defects in an engine can cause considerable delays.

When any signal is moved, altered in any way, or even replaced after being blown or knocked down, the new installation must be approved. In all cases such as this, a Sighting Committee is formed, consisting of a locomotive inspector, a representative from the Operating Department, who considers how easily the signal will be operated by the signalman, and whether it provides sufficient overlap, and one of the engineering staff, who makes certain the signal can be installed where it is required. The scheme is not approved nor the signal brought into use until all three are perfectly satisfied about the new position. In order to check the ease with which a driver on the footplate of an approaching train will be able to see the signal, it may on occasions be necessary to run a special engine or train for the Sighting Committee. In these days of bright advertising signs, and other fluorescent lighting, installations alongside the track may show lights at night which a driver could confuse with the signals, and any complaints of this nature are also investigated by a Sighting Committee. If genuine confusion can occur, it will be necessary to approach the owner of the light to have it removed or shaded.

Railways always pride themselves on the quickness with which trains are re-routed if the line is blocked. The smoothness with which these emergency services operate is due in no small measure to the work of locomotive inspectors, who, guided by Control, keep the footplate crews informed of what is happening, as well as assisting at the scene of the accident. While clearing the wreckage, vital evidence of the cause of the accident may well be destroyed, but if an inspector is there, he can make notes of any defects which will be invaluable at the resulting enquiries. Not long ago, an old six-coupled goods engine with inside cylinders broke her crank axle just after leaving a goods yard with her train, and stopped dead on one of the main running lines, blocking it completely. It would have taken several hours to dismantle the motion and remove the broken axle with its wheels, and it might, from weight considerations, have been necessary to drain the boiler before the wheels could be safely taken out. So, at the risk of doing a certain amount of additional damage, sprags were put through the spokes of the wheels, and the locomotive hauled, with all wheels locked, back into the yard. The running line was thus freed once more in a very short time.

Certain inspectors are detailed to examine any privately owned locomotive which is to be moved on its own wheels over the running lines. The railway standards of maintenance are often far higher than those adopted by private owners, whose locomotives are frequently very old. Also, on a line in a quarry, for instance, the loading gauge may be considerably larger in places than that allowed on British Railways. An examination is therefore vital if the possibility of an accident from either of these causes is to be avoided. When a privately owned locomotive travels under its own steam over the running lines of British Railways, it is always manned by a railway driver and fireman.

On special trains conveying important people, including the Royal Trains, it is customary for an inspector to ride on the footplate as an added precaution. Even when V.I.P.'s travel by ordinary trains, an inspector will travel on the footplate, having been told in confidence who is in the train behind him. During the pre-war high-speed test runs, an inspector usually rode on the engine, and although, in retrospect, the risks that were then taken now seem very great, it is recorded that on the trial run of the "Silver Jubilee," the engine rode so well that no one on her was aware of the discomfort people were experiencing in the train.

Inspectors, like shedmasters, are afflicted with bedside telephones, and in cases of emergency are often called out in the middle of the night. One evening when I had been travelling on the footplate at quite a late hour, the inspector with me mentioned that on the previous night, in thick fog, he had been called out until 3 a.m., having to make use of a light engine to get to his destination. He remarked ruefully that when he was appointed an inspector, his wife had said how nice it would be to have him working normal office hours after the irregular shifts of a driver !

This does not pretend to be an exhaustive review of the duties of a locomotive inspector, which in any case vary considerably between the various regions. It does, I hope, give some idea of the importance of their behind-the-scene work, which has such an effect on every-day railway working. In conclusion, I would like to take this opportunity of expressing my thanks to two great friends I have made among the inspectors I have met, Inspector R. C. Carter of the North-Eastern Region, and Inspector W. H. Stevens of the Southern, both now retired. Their help and advice have not only greatly assisted the writing of this article, but of many more besides.

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THE RAILWAY CORRESPONDENCE AND TRAVEL SOCIETY

Following a recent decision by the Management Committee of the Society, it is announced that applications for membership received from persons between the ages of 14 and 16 years will now be considered on their individual merits. These should be addressed to the Honorary Secretary, Mr. A. E. Hurst, 295 Portswood Road, Southampton, Hants.

NEW READING FOR RAILFANS

A MIDLAND TRAFFIC SURVEY. *The Railway Correspondence & Travel Society.* **10s., post free.**

On August 7, 1954, over 100 members of the R.C.T.S. posted themselves throughout the London Midland Region's Midland Division to record in detail the progress of traffic on a peak summer Saturday. In the months since then the reports of these amateur observers have been sifted and amalgamated into a readable and extremely interesting narrative of the day's working, in which each train is followed in its course through the Division and the reasons for any delays it incurred are analysed ; as an appendix, the progress of every long-distance train by comparison with its schedule is set out in tabular form. The result is, probably, the most revealing study yet published of the difficulties engendered in suddenly thrusting each peak summer Saturday a massive through passenger service on to a system like the Midland, which on a normal week-day is concerned mainly with a workmanlike timetable linking towns and cities within its own borders. From Monday to Friday the Midland is relatively isolated ; then on Saturdays it suddenly becomes helplessly dependent on the operating of other Divisions and Regions, whence trains stream in at 20 or more interchange points. In this survey is evidence to support a widely held belief that the summer Saturday traffic in many areas of the country has swollen to the point where it is outrunning British Railways' present arrangements to handle it. For example, as the Survey's authors make clear, the everyday motive power allocation of the Midland Division is simply not adequate for its summer Saturday passenger traffic, with the result that "4F" 0-6-0s are pressed into express haulage of lengths comparable with a trip from Paddington to Cardiff or Kings Cross to York (on the other hand, it is highly questionable whether the diagrams make the fullest possible use of the Midland's 4-6-0s on such days). Unless British Railways can take more efficacious steps to maintain the punctuality of their cross-country summer week-end trains, their poster campaign to coax holidaymakers off the road on to the train is pointless ; few motorists, even on a Saturday, would fail to surpass the overall average of 20 m.p.h. achieved by the 1.3 p.m. from St. Leonards to Leicester on the Saturday covered by the Survey, and several other cross-country trains did little better. This fully detailed Survey is well worth study, but at 10s. its 80 paper-backed pages, including some well reproduced illustrations, are expensive ; for the price one might have expected the tables to be reproduced in graphic form, which would have made their statistics and the whole picture more easy to follow.

THE DUMPY BOOK OF RAILWAYS OF THE WORLD. Edited by Henry Sampson. *Sampson Low.* **3s. 6d.**

"Each is a true encyclopædia on its subject, ingeniously packed with a *colossal* amount of information—more than any other book at ten times the price," claims the publisher of the *Dumpy Book* without qualification. Agreed, this new railway primer is extraordinary value, offering 285 5 in. by 3¾ in. pages, illustrated by over 700 line drawings, and some of its content is of a technical standard belying the gaudy cover's implication. But "true encyclopædia"—no. It is a curiously unbalanced mixture. There are chapters on topics usual in books of this kind—a summarised railway history, for example, the steam locomotive's working unravelled (with better-than-average diagrams), and a good review of modern traction, even down to a clear explanation of the free-piston gas turbine system. But the unevenness of the pot-pourri is best exemplified by the queer choice of the Burmese, German Federal and Bessemer & Lake Erie's signal aspects for diagrammatic reproduction in full as illustrations for the three short paragraphs that are the summary treatment accorded signalling and safety ; while, on the other hand, page after page is taken up by black-and-white reproductions of pre-grouping British railway coats-of-arms and the totems of U.S. railroads. One of the oddest items is a series of gradient profiles of some British and foreign routes so severely reduced that the lettering is illegible and they are quite meaningless. Among the most useful features of the *Dumpy Book* are potted statistics of the world's major railways and a long series of small general arrangement drawings of world locomotives with their dimensions ; the drawings, however, are of uneven standard (the Pennsylvania "K4s" is unrecognisable) and some readily noticeable errors, such as the transposition of the C.P.R. "Selkirk" and 4-6-4 dimensions beneath the wrong drawings, and the description of what are patently Southern Pacific and Santa Fe 2-10-4s as 4-10-2s, hint at caution in accepting the details. Carping criticism in view of what is offered for 3s. 6d. ? Perhaps, but not considering the publisher's sweeping claims. Putting them aside, it is certain that every enthusiast, young or old, will dig more than enough from the *Dumpy Book* to make it worth the price to him. **E.D.**

EAST AFRICAN LOCOMOTIVES. *East African Railways & Harbours.* **3s.**

To mark the recent visit of H.R.H. Princess Margaret to their workshops at Nairobi, the East African Railways have issued a small album of their principal motive power. The brochure depicts twelve types by photograph and diagram, accompanied by dimensional details, and among them are the "59" Class Beyer-Garratts, largest metre gauge engines in the world.

ALSO RECEIVED

The latest British Railways' publications, obtainable free of charge, include the Western Region's 48-page handbook **Party Outings by Rail**, which sets out the advantages obtainable in reduced fares for organised parties, and suggests itineraries for some attractive day excursions; and the 1956 edition of **Facts and Figures about British Railways.** The **Talyllyn Railway 1957 Calendar**, featuring six pleasant illustrations of the line, is now available from Mr. R. K. Cope, "Brynglas," Beckman Road, Pedmore, Stourbridge, Worcs., price 2s. 6d., post free.

LETTERS TO THE EDITOR

Swiss Punctuality

SIR,—The letter from Mr. M. Clifton which you publish in your November issue makes one wonder how extensive your correspondent's acquaintance with Switzerland can be. He states, for example, that "much of the main line track is single line." Of all the principal main lines in Switzerland, the Geneva-Lausanne-Berne-Zurich main line is double throughout; so is the Basle-Olten-Lucerne-Gotthard-Lugano-Chiasso main line, with the sole exception of the mile-long causeway across the Lake of Lugano; so also is the Simplon main line from Lausanne to Brigue, save for two short lengths of single track between Sion and Visp. The only remaining single track sections of the Basle-Zurich-Chur main line are a short length along Walensee lake and the 16 miles from Sargans to Chur, and work is now in progress in doubling these by stages, as also the few remaining single-track sections of the Lausanne-Bienne-Olten main line.

The only main route of any major importance still single for most of its length is the Lötschberg between Spiez and Brigue (apart from the double line through the Lötschberg tunnel). There are few Swiss lines with which I have a more intimate acquaintance than this, and in many years of observation of its working I have been amazed by its punctuality of operation, notwithstanding the density of the traffic over it and the continuous gradients as steep as 1 in 37. In my experience there is no such thing on a line like this as a train being held at its scheduled crossing loop for any train in the opposite direction which is running late; in such conditions meeting-places are varied as may be necessary. On all my journeys in Switzerland this year, once only was my train late, and this was the 9.33 a.m. from Lucerne to Berne, which started 11 min. late waiting a connection, was delayed on the single line because of a special train in the opposite direction, and also outside Berne to let one of the Zurich-Geneva expresses cross ahead into the main station. So we arrived 13 min. late; but actually the locomotive had picked up 12 min. in running. So far from there being "no scope to pick up lost time," on every run that I timed during my stay we made up time, even on the fastest trains, and arrived punctually without any apparent difficulty.

The Brunig line, to which the correspondent refers, though an important cross-country link, with its metre gauge and rack-and-pinion sections, cannot be regarded as in the main line category. Finally, it is not correct, as your correspondent claims, that "if an international train is late arriving in Switzerland, it holds up all other trains which are shown in the timetable to connect with it." If he likes to consult the official Swiss timetables, he will see that all the fastest trains linking the principal centres of population and industry in the country have a special note to indicate that they will *not* be held to wait connections. It would be impossible otherwise to maintain the extremely tight rostering of Swiss locomotives and train sets, which in certain cases are allowed less than 20 min. turn-around times even on journeys of the length of the 178 miles between Geneva and Zurich.

Hatch End, Mdx. CECIL J. ALLEN.

SIR,—I cannot agree with Mr. Clifton that the 2nd class wooden seats are as uncomfortable as your correspondent makes out. In all the coaches in which I travelled the seats were shaped to a comfortable sitting position and were much better than certain types of British Railways' stock. In due course, no doubt, 2nd class stock will be provided with upholstered seats but this facility cannot be expected overnight. While in Switzerland this summer I saw some six-wheel ex-2nds with upholstered seats, which had not been upgraded permanently to 1st class, being used as 2nd or 1st, according to requirements. When in use as 1sts the class was indicated by a board bearing that indication placed on the destination bracket on the coach side.

Harrow. G. M. KICHENSIDE.

Summer Saturday at King's Cross

SIR,—With regard to your excellent article in the October issue on the chaos at Kings Cross on July 28, the up "West Riding" was hauled by "A1" No. 60123 (not 60127) and was noted by me passing Finsbury Park under single-yellow signals at 12.26 p.m., the check being due to the 11.58 a.m. Leeds arrival with No. 60028 standing at Holloway South (I was a passenger on the 12.13 p.m. down Cambridge train, which left Kings Cross at 12.18). It is therefore apparent that the 11.58 did not arrive at Kings Cross until nearly twenty minutes after I observed it 1¾ miles away, while the "West Riding" took no less than 24 minutes to cover the final 2½ miles in from Finsbury Park (these times are comparable with the performance of L.M.R. trains over the admittedly shorter section between Engine Shed Junction and Leeds City North on similar high days and holidays !) and I suggest that these trains might profitably have been terminated at Finsbury Park to reduce platform and track occupation at Kings Cross. The 11.58, it is true, was due to form the 12.40 departure, but I see no reason why the latter train should not have been formed of the 12.7 arrival from Skegness, which came up (as was its custom) well in front of the 11.58 and had no return working ; the latter, being a "B1" turn, might have had fewer coaches than the 11.58, but there were no seat-reservation difficulties to be overcome, and you state that the 12.40 departed half-empty in any case.

With reference to "The 90 m.p.h. Era on the Eastern," by Mr. Cecil J. Allen in the same issue, I feel compelled to challenge the assertion that it is "possible" (which I take to mean practicable) to restore the 60 m.p.h. Grantham-Kings Cross pre-war schedules. No. 60014's performance recorded on page 495 certainly shows that such a tight timing could be kept in favourable circumstances, but surely it would be unwise to expect this order of achievement to be maintained in everyday working for 40 weeks in the year. The permanent speed restrictions of 20 m.p.h. through Peterborough and, worse in effect, 60 m.p.h. over the 16 miles from Hatfield to Holloway (the latter a post-war innovation) mean that drivers would need to run very close to maximum permitted speeds over the whole route in order to achieve "even time"—in fact, on account of the St. Neots temporary restriction, Hailstone had to run well over the limit on the descent from Potters Bar to Wood Green. I have been down this bank at 84 m.p.h. in comparatively recent years and I can appreciate that the existent speed limit is in the best interests of passengers. Another point which should be borne in mind is that the "Flying Scotsman" is worked from Grantham to Kings Cross nominally by nine engines and 18 sets of men, and in practice by an even wider variety from time to time, and it would be rash to expect every combination to attain the same standard of performance in running as do the highest masters of the art (and both Hailstone and "Silver Link" fall in this category). Rather, in the interests of regularity and reliability of railway passenger train working, the principle ought to be that of many of our activities, the slowest man setting the pace.

Hitchin. MICHAEL B. DEAN.

(*A number of readers have queried references in the article "Summer Saturday at Kings Cross" to the* 7.24 *a.m. Bradford* and Keighley *to Kings Cross, and the* 11.52 *a.m. Kings Cross to Leeds and* Marsden, *since Marsden and Keighley are not normally served direct by the East Coast main line. The day in question was the first of Keighley's annual holidays, and for this reason the Wakefield portion of the* 7.24 *a.m. from Bradford was specially started at Keighley. Another special rearrangement caused the replacement of the Bradford portion of the* 11.52 *a.m. from Kings Cross by one for Marsden, which was scheduled to be detached at Wakefield (Kirkgate) ; evidently, therefore, the* 11.52 *was also re-routed from its normal path between Doncaster and Wakefield (Westgate) on July* 28.—ED.)

SIR,—Contrary to your article, "Summer Saturday at Kings Cross," I should like to say that in my opinion the "J50" can hardly be called a "puny" engine. Only one other ex-L.N.E. tank has a rating as high as "4F" in the 0-6-0s' ranks, that is the "J94," which I believe is not a vacuum-fitted engine. As I have worked on the "J50" class since its arrival at Hornsey depot, I think I can safely vouch for its capabilities on all types of work. Its introduction to the South London transfer freight diagrams enabled loads to be increased over those previously worked by the "J52" and "N1" classes, and on empty carriage working I consider it superior to the "N1" (or the "N2"), owing to its smaller wheels and dry sanding to both directions of travel. To illustrate my point, I have taken fifteen bogies non-stop from Kings Cross terminus to Bounds Green Sidings with a "J50" in comparative ease, and I would prefer this type to an "N2" because it is far less liable to slip on starting.

In concluding, I can only attribute the wheezing to which Mr. Allen refers to the usual steam locomotive malady of lack of "front-end" maintenance, as the sound of the exhaust from the chimney of the "J50" is a little too harsh under most conditions to be anything less than a "bark."

Hornsey M.P.D. W. A. WHITBREAD.

Preservation of *Russell*

SIR,—The preservation of the former Welsh Highland Railway locomotive *Russell* is being undertaken by the Birmingham Locomotive Club, and it is intended that it should be a permanent exhibit in the newly formed Talyllyn Museum at Towyn. In spite of willing assistance given by many volunteers, the cost to date of the locomotive's transport to Towyn, etc., has been about £170, and if *Russell* is to be restored to its former glory further expenditure will be inevitable.

The task of raising such a sum in a small provincial club is proving extremely difficult, and about half the cost is at present covered by short term loans. These loans must be repaid during the next few months, and unless further financial assistance is obtained *Russell* will probably have to be sold for scrap.

Now that this project has progressed so far, I am sure that no railway enthusiast wants to see this historic locomotive scrapped, and I am thus taking the liberty of making a general appeal to save *Russell*. Donations should be sent to : Mr. T. J. Edgington, Hon. *Russell* Fund Treasurer, 57 Heathfield Road, Kings Heath, Birmingham, 14.

Birmingham Loco. Club.

AIDAN L. F. FULLER.

The Plunder of the North Staffordshire

SIR,—I was most interested to read Mr. Keys' account of the poor deal received by the lines of the former North Staffordshire Railway since 1923 (*October issue, page* 504), and whilst I agree entirely that the policy of "Starve and Close" started at that time, in the case of some of the services reviewed this has taken place in more recent years than suggested by the writer.

The L.M.S. timetable for the summer of 1939 shows some 45-50 trains in each direction, at fairly well spaced intervals, on the "Loop Line," as compared with the total of 109 in N.S. days, although many of the 1939 trains ran between Stoke and Tunstall or Newchapel only. I fully endorse the writer's suggestion that this line could be revived by the introduction of a 15-minute service of lightweight diesel units. So far as the Buxton-Ashbourne-Uttoxeter section is concerned, the 1939 services were slightly better than those operating in 1954, and a Sunday service was in operation until the outbreak of war. The 1939 summer service between Stoke and Leek consisted of some 11 trains in each direction, increased to 14 on Saturdays, which again appears to be a similar service to that operating in N.S. days. The statements in regard to Sunday services on this line are not quite correct, as in 1939 there were six trains in each direction, whilst a service of two trains has been operated during several of the post-war summers.

St. Albans. A. J. SUTCLIFFE.

The Trentham Gardens branch

SIR,—To answer a point raised by Mr. Robert Keys in his lament for the N.S.R. in the October issue, the Trentham Gardens branch (as it is now entitled) is still in active use. During the last summer there were frequent excursions to the Gardens station from the Birmingham area, usually on Sundays but also on certain mid-week dates. After the regular service had been withdrawn on this branch in 1927, an advertised local service continued to operate on Sundays during the summer months, a curious arrangement which ceased with the outbreak of war in 1939.

Of the other closed lines mentioned in this article, Ford Green station on the Biddulph branch is still served once a year by special passenger trains at the start of the Potteries holiday week.

Surbiton. J. N. FAULKNER.

Diesel fumes

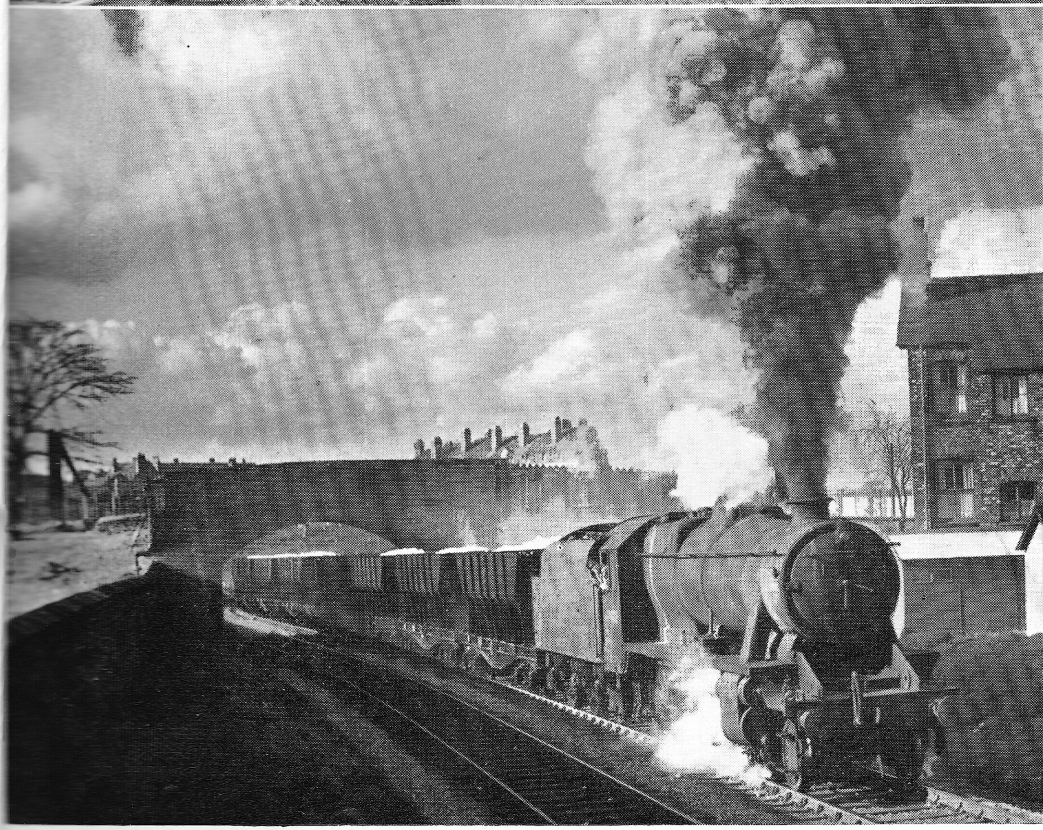
SIR,—Referring to the letter from Mr. P. W. Semmens in the October issue, there is a reference to smoky locomotive depots and lung cancer. This prompts me to draw attention to a curious phenomenon which has occurred in the Midlands.

There is a point where a line carrying a fair amount of traffic enters the mouth of a tunnel which is low down between two high retaining walls. In former days when steam locomotives were the order of the day, the trees growing near the tunnel mouth appeared to flourish quite well, in spite of the fact that after the passage of a train there was a steady upstream of smoke after the train had passed through the tunnel. Strangely enough, since the introduction of diesel trains, three sallow trees growing quite near to where the smoke and steam used to rise have now died. Other trees such as ash and willow have not been affected, but as the sallow trees had been growing healthily for about twenty years, the phenomenon is a striking one, although obviously it would not be fair to judge from this one case that all sallow trees would be killed by diesel fumes.

(*Name and address supplied.*)

Right : Ex-L.N.W. 0-8-0 No. 49024 assisted in rear by a 2-6-4 tank, tackles the ascent of Shap summit with a northbound West Coast Route freight on May 15, 1954. [*J. E. Wilkinson*

Right : Stanier 2-8-0 No. 48695 in the toils on the 1 in 150 bank between Altrincham and Hale with a haul of limestone for the I.C.I. plant at Northwich on an April day in 1956. [*D. J. Beaver*



MOTIVE POWER MISCELLANY

LONDON MIDLAND REGION

The "Deltic" diesel reappeared on passenger duty on October 29 when it took up work on the southbound "Merseyside Express" and northbound "Shamrock" ; we hear rumours that it may shortly be seen on Anglo-Scottish workings. The first Crosti-boilered 2-10-0 to be seen in the London area of the Western Division was reported on September 29, when No. 92021 passed through Watford with a southbound freight. On four Sundays from September 23 to October 14 inclusive, the electric service between Watford Junction and Harrow was replaced, owing to engineering works, by a steam push-and-pull service powered by standard 2-6-2 tank No. 84004 (1E) ; this was the first sight of this standard design in the London area. The latest "guinea-pig" for the Rugby Test Plant is a "Jubilee" 4-6-0, No. 45722. A visitor to Crewe in mid-October was one of the few remaining "Star" 4-6-0s of the W.R., No. 4061. An unusual sight on the Shrewsbury-Stafford branch on October 6 was Pacific No. 46244, heading the 3.10 p.m. local from Shrewsbury ; it did not take up the usual Saturday return working, the 6.20 p.m. from Stafford, which was dealt with by a compound 4-4-0.

The influx of standard 2-6-4 tanks to North Wales is of much larger proportions than first reports indicated last month. At least 20 of these engines have been collected from Kentish Town, Bury and Newton Heath and allocated to Chester and Bangor in exchange for the entire stud of Stanier and Fairburn 2-6-4 tanks on the North Wales coast.

Referring to recent notes on diesel workings in the Midlands, a correspondent supplies further details which illustrate that some use is now being made of the multiple unit scheme for through workings. The 8.43 a.m. Birmingham-Peterborough is formed of three two-car units, one of which is through from Lichfield and is coupled to the main train at New Street. At Rugby the rear two-car unit is detached and forms the return 10.20 local to Birmingham, the remainder continuing to Peterborough East, whence they return at 1.45 p.m. to Birmingham and later have a duty to Stafford.

A visitor to Horwich works on October 20 found that frames had been laid for new Class "4" 2-6-0s Nos. 76075-8. The ex-L. & Y. 2-4-2 tank No. 50621, the first locomotive built at Horwich, which was withdrawn some time ago, is still intact there.

(For L.M. news we are indebted to Messrs. G. E. Jones, A. B. Wilson, H. L. Mills, A. S. Woodcock, K. Howard, C. J. Bowyer, I. D. M. Milne, P. J. Poulton, J.G., R. Bullock, G. E. Trinick, T. Handorff, R. Bellingham, P. J. Hobart and L. Salmon.)

EASTERN REGION

The East Coast main line

The publicity accorded the "Talisman" has overshadowed the acceleration of the 3.15 p.m. Kings Cross-Niddrie Class "C" freight, which is now booked from London to York non-stop in 288 min. This timing includes an allowance for diversion to the slow line between Tallington and Stoke to allow the down "West Riding" and "Talisman" to overtake the freight, but otherwise the latter runs throughout on the fast line. After a short layover at Skelton Sidings, York, for train examination and crew refreshment, it departs at 8.28 p.m. for Newcastle, where it is due at 10.22 p.m. As reported last month, a Kings Cross "A1" or "A4," with Kings Cross men, works the freight right through to Newcastle and returns next day on the 10 a.m. from Newcastle (12.34 p.m. on Saturdays, 11 a.m. on Sundays).

Another new development is that Kings Cross shed is now responsible for the down "Aberdonian" as far as Grantham, the Grantham engine which previously had this job now going down on the 8.20 p.m. mail. This change is a by-product of several other altered diagrams, which, amongst other things, have given New England the down "Flying Scotsman" as far as Grantham, and Grantham shed the 10.20 a.m. down from Kings Cross and the 2.47 p.m. back from Grantham. The 2.47 features in a Grantham engine diagram beginning with the 6.26 a.m. thence to Leeds (3.50 a.m. ex-Kings Cross), continuing with the 12.35 p.m. Leeds-Kings Cross, on which crews are changed at Grantham ; during October a New England engine, "A2/3" Pacific No. 60513, made several appearances on this turn.

In late October diesel railcars made their first trips over the main line in the London area, but purely in connection with staff training and not as a prelude to their use on public service. On Mondays a car runs from Stratford via Dalston Junction to Hadley Wood, where it calls for the benefit of the new drivers' diesel training school in the neighbourhood, and Harston, on the Cambridge branch ; it is stabled at New Barnet each night and runs thence to the Cambridge branch each day until Friday, when it returns to Stratford. On the afternoon of October 27 Haymarket "A3" No. 60041 was noted at Huntingdon, where it stopped with an up freight troubled with a hot box on one of its wagons, while Nos. 60043/98 of the same shed were at Peterborough on October 28 and 21 respectively. A new Swindon-built 2-10-0 No. 92089, was on New England shed on October 28.

The G.E. Section

For the second October meeting at Newmarket the E.R. made a special bid to attract race traffic. An all-in fare was offered, covering road transport between Newmarket station and the Heath and admission to the course, and the train timing was accelerated to what, we believe, is a new record for the Liverpool Street-Cambridge route. With a limited load of eight bogies, including refreshment car, a "B1" was required to pass Cambridge (55¾ miles) in 59 min. and to average 63½ m.p.h. in covering the 49¾ miles from Tottenham to Cambridge in 47 min. pass to pass. The best regular booking in the timetables over this route is in the reverse direction by the Sunday 7.15 p.m. from Cambridge, which reaches Liverpool Street in 64 min. start to stop and Tottenham in 51 min. start to pass. On October 16 our correspondent noted the first of these race specials through Tottenham in 10 min. after departure from Liverpool Street, instead of the 12 min. allowed. The "B1s" provided for the race trains had been specially cleaned for the job. Unusual power for the 8.50 p.m. Liverpool Street-Ely on October 8 was "4MT" 2-6-0 No. 76033 (30A). A reader supplies details of a most unusual working which occurred on August 14 last, when a boat train, complete with Pullman and roofboarded "Ocean Liner Express," was taken from Waterloo to King George V Dock, North Woolwich, by way of Willesden Junction, Gospel Oak and South Tottenham ; as far as Stratford, at least, the train was hauled by S.R. Pacific No. 34012. A newcomer to the Tilbury section is auto-fitted "C12" 4-4-2 No. 67363.

East Anglian branches

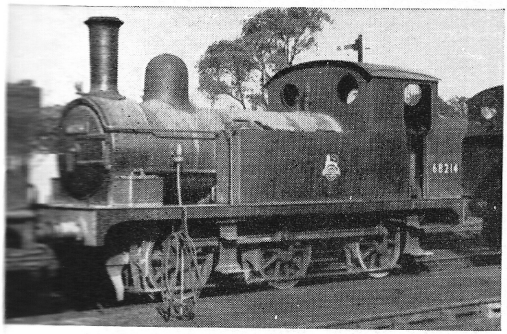
The "G5" 0-4-4 tanks have now been banished from the Audley End-Saffron Walden branch, after a final inglorious farewell when all three were non-starters and two "E4s," Nos. 62787/9, had to deputise. The new occupants are "N7" 0-6-2 tanks Nos. 69551/90/2, redundant at Annesley and Lowestoft, which have recently been transferred to Cambridge for the purpose. On October 6 a stranger noted at Long Melford was "WD" 2-8-0 No. 90447 (40B), heading a pick-up freight from Colchester to Whitemoor via Sudbury and Bury St. Edmunds. A regular job for one of the three ex-L.T.S. 4-4-2 tanks now stationed at Colchester is the 5.11 p.m. slow train to Clacton. Regarding a recent note concerning No. 43089, an Ivatt "4" 2-6-0 at Cambridge, it is used on the cross-country routes to Colchester; last summer it was a regular performer on the Saturday Leicester-Clacton through train (10.49 a.m. ex-Cambridge) and 7.11 p.m. (SO) Clacton-Sudbury-Bury St. Edmunds, and from another reader's letter it would appear also to work nowadays on the 4.16 p.m. Colchester-Cambridge via the Colne Valley.

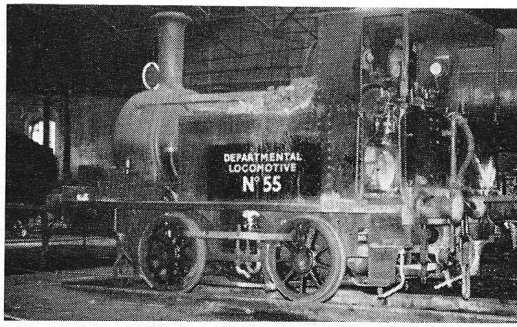
(For E.R. information we are indebted to Messrs. S. Fox, K. E. Skinner, G. Tweedie, H. Leah C. Ertle, H. Morling, H. W. Herbert, G. E. Jones, C. Cock, S. Petriburg, J. R. Besley, P. G. Robson, P. J. Cannon, J. G. Bennett and N. Caplan.)

NORTH EASTERN REGION

Last N.E.R. 0-4-0 tank goes

The last ex-North Eastern steam 0-4-0 tank in service on British Railways is reported withdrawn. This is Departmental No. 55, ex-No. 68091, of the original dock tank Class "Y8" introduced by T. W. Worsdell in 1890. Latterly No. 55 has been the shed pilot at York, where it survived a general overhaul some three years ago. Recently the cylinder casting cracked seriously and at about the same time the boiler was condemned ; since there are no spares, No. 55's end is inevitable. The three "T1" 4-8-0 tanks allocated to York are used for inter-yard transfer traffic, but





★ Here are two classes recently made extinct by withdrawals. No. 68214, on the left, was the last survivor of the Great Eastern Class "E22," L.N.E.R. Class "J65," a Holden design introduced in 1888. They were suburban passenger engines in their prime, and used to work on the Fenchurch Street-Blackwall service as 2-4-0s, with the leading section of their coupling rods removed. On the right is the last ex-N.E.R. Class "Y8" 0-4-0T, to the withdrawal of which reference is made on this page. [*H. N. James, B. E. Morrison*

occasionally one is put on shed pilot work ; they are not popular machines with the men, who prefer a "J25," and are often laid up. The two Doncaster-built Class "4" 2-6-0s allocated to York in the autumn, Nos. 76051/2, have been moved on to Kirkby Stephen ; while at York they were used on freight jobs and travelled as far afield as Peterborough and Mexborough, but York had limited use for them owing to their unsuitability for some of the shed's fast freight and passenger duties through smallness of driving wheels. On October 7 "Britannia" No. 70039, ex-works, brought a Class "C" freight from Doncaster into York and returned with a Class "E" goods next day.

"B1s" and "V2s" to be green?

A correspondent who visited Darlington Works on October 20 learned that "B1s" and "V2s" are to be liveried green and lined out as soon as paint supplies become available. New construction of standard Class "2" 2-6-0s was continuing, No. 78060 awaiting delivery to Wigan and Nos. 78063/4 being almost complete. Undergoing heavy repairs were Class "3" 2-6-0 No. 77000 and 2-6-2 tank No. 82029, the first of these types to be dealt with at Darlington, while an arrival from distant parts for attention was Cambridge 2-6-0 No. 46465.

The Hull diesel units

The Craven diesel multiple units being delivered to the Hull district, reports a correspondent, will be serviced and refuelled at Springhead, although stabling accommodation is to be provided at Botanic Gardens. For this purpose the narrow entrance archways at Springhead, which are too tight for the railcars (they bear scars from "04" and "WD" 2-8-0s as well), are being removed in the course of modifications to the depot. The first unit has made some lengthy journeys from Hull, including two to York via Market Weighton and back via Selby.

(For N.E.R. information we are indebted to Messrs. R. A. King, K. A. Gray, D. Joy, P. J. Taylor, I. D. Bulmer, L. A. Pickering, C. B. Brown and M. Brown.)

WESTERN REGION

Plymouth-London and back daily

Details have now reached us of the three Laira diagrams for modified "Kings," mentioned last month, which require the engines to travel from Plymouth to Paddington and back daily. The diagrams concerned are : 7.15 a.m. Plymouth-Paddington and 6.30 p.m. back ; 12.30 p.m. Plymouth-Paddington and 9.50 p.m. back ; and 2 p.m. Plymouth-Paddington and 12.30 a.m. newspapers back. The latest addition to the stud of double-chimney "Kings" is No. 6007, but No. 6029 has reappeared from Swindon without modification. A Stafford Road "King," No. 6011, found its way on to the 3.30 p.m. Paddington-Plymouth on October 6, as a result of unknown mischance upsetting the workings, for No. 6011 was down for the 4.10 p.m. to Wolverhampton ; this is the "King" fitted with an experimental water-softening apparatus, so its impending arrival had to be hastily wired through to Laira. Newton Abbot again has a share in the working of the "Torbay Express," providing the engine for the down train on Tuesdays, Thursdays and Saturdays.

West of England

A rare event on October 4 was the use of a W.R. 2-6-2 tank, No. 5501, to work an engineer's special over the ex-S.R. route to Barnstaple Junction. Since October 15 a train has been running again on the Princetown branch, but an unhappy one—the demolition train, powered by No. 4568, the last regular engine on this branch in its revenue-earning days. "Star" No. 4056 is still working to the far west ; after being seen with the 8 a.m. Exeter-Newton Abbot on October 8, it was noted on the 12.55 a.m. Manchester-Penzance (two hours late) four days later and on the afternoon parcels train from Cornwall to Bristol on October 23. A correspondent who spoke to the crew manning her on a Swansea-Penzance train on October 5 heard that she was getting rough and deteriorating (the crew were also pessimistic about the life of pioneer "Castle" No. 4073). A stranger at St. Blazey shed during October was "Castle" No. 5048 (82A) ; as St. Blazey has a hoist, it often takes over "lame ducks" arriving at neighbouring sheds which require lifting.

The Caprotti standard "5s"

All ten of the standard "5" 4-6-0s with Caprotti valve gear so far built have been allocated to Shrewsbury shed. As a result, conventional engines of this class have been transferred away, Nos. 73033-5 to Oxley and Nos. 73036/7 to Tyseley, to replace scrapped "ROD" 2-8-0s. The five survivors of the latter type on the W.R. are now concentrated at Carmarthen. It appears that the renumbering of the "93XX" class 2-6-0s forecast some months ago has begun, as on October 14 No. 9317 was observed at Oxley with 7339 painted on the cabside, where its G.W. numberplates had been ; the numbers were in the style of the old G.W. plates, however.

Diesel shunters Nos. 13258-62 have been allocated to Llanelly and are working at the Trostre Works of the Steel Company of Wales ; as a result, five "94XX" Class 0-6-0 tanks have been stored. The Taff Vale

0-6-2 tanks are reported to have lost their jobs on the Swansea-Treherbert passenger services, which are now handled by standard 2-6-2 tanks and "56XX" Class 0-6-2 tanks. Neyland "County" No. 1006 appeared in Shrewsbury early in October ; harnessed to Mogul No. 9308, it arrived with the 12 noon Penzance-Manchester on October 5, leaving next day at 2.25 a.m. with the 11.50 p.m. Manchester-Swansea, then reappearing with the 11.50 a.m. Swansea-Manchester and finally departing for good with the 2.55 p.m. Manchester-Cardiff—by which time, doubtless, it knew its way about the North-and-West route !

In our October issue we reported the visit to Oxford of "B17" No. 61665 on the "City of Leicester Holiday Express." We hear that the stranger worked its train through to Windsor and was serviced at Slough shed that afternoon.

(For W.R. information we are indebted to Messrs. J. M. Craig, J. M. Finlay, R. C. Sambourne, M. F. J. Arscott, R. Clemo, D. Harris, J. R. P. Edmunds, M. Fulton, R. A. Cover, J. R. Morgan, J. E. Gould, R. C. Griffiths and P. Williams.)

SOUTHERN REGION

Eastern Section

When H.M. the Queen visited the Medway towns on October 24, the Royal Train was made up of the Pullman *Orion* and two BFKs, headed by "Schools" 4-4-0 No. 30925, newly liveried in green with red-backed nameplate. The 4-4-0 was turned on the triangle at Sittingbourne (possibly the first time a "Schools" has used it) after it had worked the empty stock back from Meopham, where the Queen detrained, to Gillingham. The return working to London originated from Gillingham. Bricklayers Arms engines are common visitors to Gillingham, but not usually their ex-L.B.S.C. types, so that "C2X" 0-6-0 No. 32554 was a surprising sight early on October 11. The range of types repaired by Ashford Works is being extended ; on October 15, "M7" 0-4-4 tank No. 30110 (70C) and "700" 0-6-0 No. 30368 (70D) were on hand, and were probably the first of their classes to be dealt with there.

"Jubilee" at Clapham Junction

Probably unprecedented was the use on October 5 of "Jubilee" No. 45675 (20A) to head a Battersea-Cricklewood haul of coal empties, which was seen passing through Clapham Junction that afternoon. Two standard "5" 4-6-0s, Nos. 73087 and 73116, have been transferred to Eastleigh. On October 22 Bulleid Pacific No. 34093 slipped itself to a stand-still on the gradient in Bincombe Tunnel with the 7-coach 8.25 a.m. Weymouth-Bournemouth stopping train. Eventually the 8.40 a.m. Weymouth-Maiden Newton auto-train, headed by 0-4-2 tank No. 1453, was allowed into the section to give the defaulter rear-end assistance out of the tunnel. News has just reached us that on September 7 one of the big W.R. mixed traffic 2-8-0s, No. 4707, worked into Salisbury with a freight from Westbury ; these engines are believed to be barred officially from the Westbury-Salisbury line, as only once before has one managed to slip through, and that during the last war.

(For S.R. information we are indebted to Messrs. M. J. Whybro, K. R. Rushen, G. C. Wright, D. Russell, B. R. C. Elphick, "Pegasus," R. R. May, R. Ratcliffe and M. Sorrell.)

SCOTTISH REGION

The East Coast Floods

We are grateful to the Public Relations Officer of the Scottish Region for further information, which fills in the picture given in our November notes, of the re-routing of East Coast Route trains as a result of the floods at the end of last August. On August 28 the up "Flying Scotsman," 8.32 a.m. Glasgow (Queen Street)-Kings Cross and 10.5 a.m. Edinburgh-St. Pancras had all entered the Waverley Route before it became blocked, so that they had to be reversed to Edinburgh ; their route on to the West Coast main line was via Haymarket West, Dalry Junction and Carstairs. We understand that the "Flying Scotsman" eventually rolled into Kings Cross at 1 a.m. The up "Queen of Scots" was worked from Glasgow (Queen Street) to Edinburgh (Princes Street) and thence to Carstairs, while the 5.15 p.m. Edinburgh-Leeds was started from Princes Street instead of Waverley, road transport being used to convey connecting passengers off the 3.58 p.m. from Glasgow (Queen Street) between the two Edinburgh stations. The last train to get through the East Coast Route in the down direction was the 12.55 a.m. Kings Cross-Edinburgh, but it was heavily delayed by the rising floods ; the down "North Briton" was re-routed via the West Coast line and Carstairs to Edinburgh (Princes Street), a four-coach connection for Glasgow passengers being arranged from Carstairs to Glasgow (Central). As we reported last month, the down "Elizabethan" and "Flying Scotsman" reached Waverley by way of Carstairs, Dalry Junction and Haymarket West, but the 10.10 a.m. from Kings Cross was able to use the Waverley Route and so did the group of night trains leaving Edinburgh (Waverley) at 8.0, 10.20 and 10.40 p.m. ; the 7.10 and 7.35 p.m. from Aberdeen to Kings Cross, however, were routed via Dundee, Perth, Stirling and Carstairs, and the 8 p.m. Perth-Kings Cross ran the same way. When both tracks of the East Coast main line had been restored on

August 30, all up trains other than loose-coupled freights were required to take on a pilot over the affected section, reportedly to ensure maintenance of speed limits, and for some hours such unusual pairings were to be observed in the Grantshouse area as a "J36" and an "A3" on the up "Heart of Midlothian" and a "D34" and "A4" on the up "Elizabethan."

The Waverley area

"Jubilee" 4-6-0 No. 45704 (68A) worked over the Waverley Route with the 10.27 a.m. Portobello-Carlisle freight on October 25 and next day on the 11 a.m. Niddrie-Carlisle fitted freight. Another Kingmoor "Jubilee" was observed off its beaten track on October 6, when No. 45673 stopped at Dunfermline with the 3.40 p.m. Inverness-Edinburgh. A new visitor to this part of the world is a Dalry Road Class "4" 2-6-4 tank, which is used on an unadvertised early morning Sunday train to Rosyth that used to start from Waverley but now originates from Edinburgh (Princes Street) ; the stock is worked on empty to Dunfermline, whence engine and train return as the 8.45 a.m. public service to Princes Street. Our correspondent notes that on most days except Saturdays a Polmadie standard "5" 4-6-0 has a freight job on the Leith North branch ; in the first week of October the engine involved was usually No. 73057. Class "J36" No. 65216 is reported to have lost its painted name *Byng*.

The North of Scotland

On October 6 the modern Royal Train made probably its first trip on the Buchan section of the G.N.S. area when H.M. the Queen Mother visited Fraserburgh ; motive power from Ballater to Kittybrewster was provided by "B1" No. 61323 and thence to Fraserburgh by No. 61350, which worked right through to Ballater on the return journey. The hold of the ex-Highland 0-4-4 tanks on the Dornoch branch has been broken with the recent appearance of ex-Caledonian 0-4-4 tank No. 55226.

(For Scottish news we are indebted to Messrs D. W. Smith, K. A. Gray, W. G. Laing, R. Barbour, C. Judson and M. Ray.)

LOCOMOTIVE STOCK CHANGES

"N.Y.A." denotes "not yet allocated" (on official lists received). This list is correct to the following dates : E. & N.E.R.—October 20, 1956 ; S.R.—October 27, 1956 ; W.R.—September 8, 1956 ; L.M.R.—October 6, 1956.

NEW ENGINES

Diesel Mechanical 0-6-0 : 11161/2-32A ; 11179/80-40A ; **Diesel Electric 0-6-0 :** 13268-81D ; 13269/70/1/2/3/4-N.Y.A. ; 13317-52E ; 13318/9/20-50A ; **Class "5" 4-6-0 :** 73130/1/2-N.Y.A. ; **Class "4" 2-6-4T :** 80144-34E ; 80145-75A ; **Class "9F" 2-10-0 :** 92089-36A ; 92106/7-15A.

ENGINES WITHDRAWN

37, 391/9, 3043, 30728/36/47, 31549/74, 31737, 32422/5, 32511/4/82, W2, 40323, 41160/6, 41686, 43204/26, 43943, 47256, 50650, 51345, 51464/79, 52197, 58091, 62343/5/86, 62542, 65143/71, 65425/35, 67269/84/6, 67333/92, 68128, 68813/22/36, 69321/5/51/90.

ENGINES REALLOCATED

London Midland Region : 12073-18A ; 13123-9D ; 40020-1C ; 40129-3C ; 40157-2B ; 40421-3C ; 40542-16A ; 41098, 41151-11E ; 41144-15C ; 41536-17B ; 42063-26A ; 42156/7/78-14B ; 42159-14C ; 42228-17A ; 42308-6C ; 42315/44/66/7-5D ; 42417-6D ; 42418/21/5-5C ; 42423-10C ; 42444/55/60, 42588-26D ; 42450/1/61, 42568, 42660-26A ; 42453, 42540/87/95, 42610/7-14B ; 42563-10C ; 42764-21A ; 42855-14A ; 42932-5B ; 43745-19A ; 43858-17B ; 43898-15D ; 43904-11B ; 44206-19C ; 44425, 44501/89-17A ; 44547-19A ; 44562-17B ; 44819-17A ; 44833-2A ; 44938-9A ; 45014/46-11A ; 45045-5B ; 45050-2E ; 45142-6B ; 45182, 45286, 45317/28/94-12A ; 45187-1A ; 45260-17A ; 45289-5A ; 45291-11A ; 45301/5/11-5B ; 45375-1A ; 45403-3D ; 45430-1A ; 45441-6A ; 45503-12A ; 45545-5A ; 45553-9E ; 45622/8-9A ; 45602-17A ; 45722-RTS ; 46110/51/61, 46226/52-5A ; 46135-9A ; 46147/9-6J ; 46150-12A ; 46200/10-8A ; 46426-11E ; 46459-3A ; 47490-8D ; 47611-17B ; 47616-8D ; 48005-17A ; 48037-18B ; 48142/91/8-15B ; 48258-2B ; 48293, 48403-17A ; 48395-18A ; 48626-5B ; 48683/93-8B ; 48734-9D ; 49275-3A ; 50829/87-26C ; 51499-26B ; 52551-10A ; 58123-11B ; 75032/3-6A ; 78031/8-6D ; 80045/7/8/9/50/1/2/3/9/62/3/86-6A ; 80087/8/9/90/1/2/4/5-6H ; 90277-24C.

Eastern Region : 11114/55-34E ; 11141-32C ; 51512-39A ; 60039-38C ; 61005/6-35A ; 61066-38A ; 61111-34A ; 61209-38A ; 61302/92-35A 61311-34A ; 61645/6-31A ; 62597-32F ; 62605-31A ; 64236-36E ; 64913-32A ; 65557-32G ; 67363-33B ; 67772/4-34A ; 67776, 67800-35B ; 67788/98-38A ; 68508-36E ; 68554-31A ; 69322-40E ; 69354-36D ; 69550/5-34A ; 69651/90/2-31A ; 69698-33B ; 69706-32A ; 69801/28-39A ; 69809/25-38B.

North Eastern Region : 40552-55A ; 41273-55F ; 42702-55C ; 43056-52B ; 43130-51A ; 60884-56B ; 60885-56C ; 61011/3, 61189-56B ; 61214-56C ; 61320-56G ; 61433-50C ; 61844/69-52B ; 62700/7-53D ; 62755/61/72/5-50C ; 63466/7/74-54A ; 65039-52C ; 65785, 65823/73-54C ; 65802-52E ; 65864-52B ; 67280, 67311-56C ; 76050-51F ; 76051/2-51H ; 90100-53A ; 90122-56E ; 90126-56F ; 90633-56A ; 90655-56D ; 90670-53A.

Southern Region : 11001-75C ; 73087, 73116-71A.

Western Region : 349-88E ; 2213-82B ; 3408-88B; 3633/79-87C ; 4101-88A ; 4105-83A ; 4954-81F ; 4983-82B ; 5002-87G ; 5154/64/78/83-83A ; 5160-84K ; 5322-81E ; 5350-85A ; 5379-84C ; 5422-82D ; 5558-83A ; 5704/43-87C ; 5809-89C ; 6341-85B ; 6355-84C ; 6401-86A ; 6619-88F ; 6849-86A ; 6966-82C ; 6982-82B ; 7321-85A ; 8408/75/6/83-87D ; 9018-89C ; 9491-87D ; 9744-87C ; 13258-86E ; 13264/5/6/7-87B ; 73128/9-84G ; 75023-82C ; 82005-88F ; 82009/34-84H ; 90312-86A.

S.R. ELECTRIC UNITS

New : 5229/30/1, 5764, 7002. **Withdrawn :** 4529/30/2/47. **Reformed :** 4503/4.

ALTERED SHED CODES

Old No.	*Shed*	*New No.*
20A	Leeds (Holbeck)	55A
20B	Stourton	55B
20C	Royston	55D
20D	Normanton	55E
20E	Manningham	55F
25A	Wakefield	56A
25B	Huddersfield	55G
25C	Goole	53E
25D	Mirfield	56D
25E	Sowerby Bridge	56E
25F	Low Moor	56F
25G	Farnley Junct.	55C
37A	Ardsley	56B
37B	Copley Hill	56C
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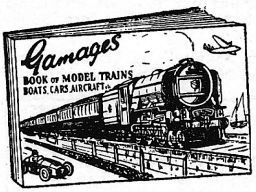

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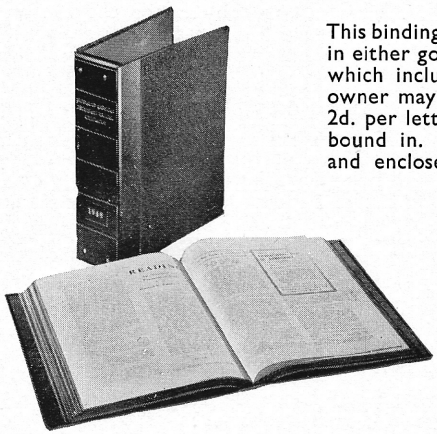

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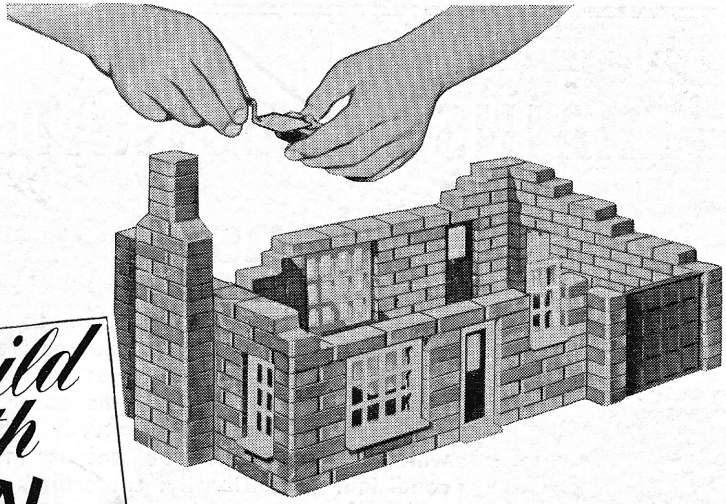

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